COMMONWEALTH OF MASSACHUSETTS

DISTRICT POLICE REPORT

1908

Public Document No. 32

REPORT OF THE CHIEF

OF THE

MASSACHUSETTS DISTRICT POLICE,

FOR THE

YEAR ENDING DEC. 31, 1908,

INCLUDING THE

INSPECTION AND DETECTIVE DEPARTMENTS.

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The State Board of Publication.

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Commonwealth of Massachusetts.

Office of the Chief of the District Police,
State House, Boston, Mass., Jan. 1, 1909.

To His Excellency Curtis Guild, Jr., *Governor, Commonwealth of Massachusetts.*

Sir: — In accordance with the provisions of chapter 108 of the Revised Laws of this Commonwealth, I have the honor to submit a report of the duties performed by the District Police for the year ending Dec. 31, 1908: —

REPORT.

The following changes have been made in the personnel of this department during the year: —

Appointments.

Name.	Position.	Date of Appointment.	Residence.
Atkinson, Harry,	Factory and workshop inspector.	July 9, 1908,	Natick.
Barlow, Maximillian A. J.,	Stenographer,	July 22, 1908,	Boston.
Beyer, Richard S.,	Building inspector,	June 9, 1908,	Boston.
Bligh, Thomas E.,	Detective,	Mar. 11, 1908,	Pittsfield.
Buxton, Mary E.,	Stenographer,	Jan. 8, 1908,	Peabody.
Fall, Lewis P.,	Clerk,	Oct. 13, 1908,	Boston.
Kearney, John B.,	Boiler inspector,	Nov. 9, 1908,	Boston.
Lovering, Arthur F.,	Boiler inspector,	Jan. 13, 1908,	Northampton.
Mackintosh, George D.,	Boiler inspector,	May 15, 1908,	Revere.
McDonald, Angus H.,	Factory and workshop inspector.	Nov. 30, 1908,	Cambridge.
Moran, Edward,	Boiler inspector,	Jan. 13, 1908,	Lowell.
Penniman, Walter A.,	Building inspector,	June 10, 1908,	Worcester.

Retirements.

Name.	Position.	Date of Appointment.	Date of Retirement.	Cause of Retirement.
Buxton, Warren S.,	Building inspector,	Mar. 16, 1881,	Apr. 30, 1908,	Retired.[1]
Campbell, James P.,	First clerk,	Aug. 1, 1883,	Oct. 10, 1908,	Retired.[1]
Coughlin, John,	Storehouse keeper,	Spring of 1880,	Jan. 1, 1908,	Resigned.
Dyson, Joseph M.,	Building inspector,	July 7, 1879,	June 30, 1908,	Retired.[1]
Kazar, John H.,	Boiler inspector,	Jan. 1, 1896,	Nov. 2, 1908,	Retired.[1]
McCarthy, Justin H.,	Boiler inspector,	Aug. 30, 1906,	Jan. 8, 1908,	Removed.
Ryan, Samuel L.,	Factory inspector,	Aug. 26, 1903,	Mar. 25, 1908,	Death.
Sheehan, John J.,	Building inspector,	Mar. 19, 1891,	May 18, 1908,	Death.
Sillars, Malcolm,	Factory inspector,	Apr. 9, 1894,	Nov. 30, 1908,	Retired.[1]

[1] Retired under Veterans' Retirement Act of 1907, chapter 458.

NOTE.

See page 8. *Factory and Building Inspectors.*

The sudden death of Inspector Frank C. Wasley, on Dec. 30, 1908, causes a vacancy in that part of Districts Nos. 1 and 2, formerly under his jurisdiction.

Massachusetts District Police.

JOPHANUS H. WHITNEY, *Chief.*

GEORGE C. NEAL, *Deputy Chief, Detective Department.*

JOSEPH A. MOORE, *Deputy Chief, Inspection Department.*

Detective and Fire Inspection Department.

Detectives.

Name.	Assigned.	Residence.
Barrett, Michael J.,	Tramp officer,	Haverhill.
Bligh, Thomas E.,	Hampden and Berkshire counties,	Pittsfield.
Bradford, Ernest S.,	Barnstable County,	Hyannis.
Byrnes, Charles E.,	Middlesex County,	Somerville.
Dexter, Thomas A.,	Dukes and Nantucket counties,	Edgartown.
Flynn, Frederick F.,	Essex and Middlesex counties,	Lawrence.
Hardiman, Frank P.,	Special duty,	Lynn.
Hodges, Alfred B.,	Bristol County,	Taunton.
Keating, Arthur E.,	Suffolk County,	Somerville.
McKay, James,	Franklin and Hampshire counties,	Northampton.
Molt, Robert E.,	Worcester County,	Millbury.
Murray, Peleg F.,	Worcester County,	Worcester.
Proctor, William H.,	Steamer "Lexington" and general duty,	Swampscott.
Scott, John H.,	Norfolk and Plymouth counties,	Braintree.
Wells, Arthur G.,	Essex County,	Lynn.

Fire Inspectors.

Rice, Charles F.,	Chief Fire Inspector,	Somerville.
Anderson, James,	District No. 1,	Springfield.
Collamore, Henry H.,	District No. 3,	Fall River.
Crittenden, George F.,	District No. 4,	Northampton.
Eustace, Thomas F.,	District No. 2,	Boston.
Grady, James J.,	District No. 6,	Winthrop.
Smith, Silas P.,	District No. 5,	Everett.

INSPECTION DEPARTMENT. — *Factories and Public Buildings.*

Building Inspectors.

NAME.	Assigned.	Residence.
ADAMS, CHARLES,	District 5,	Worcester.
BALL, HORACE F.,	District 2,	Worcester.
BARDWELL, HENRY J.,	Districts 3, 6,	Boston.
BEYER, RICHARD S.,	District 1,	Boston.
BROWN, EDWIN Y.,	Districts 3, 4, 9,	Winthrop.
BURFITT, CHARLES E.,	District 2,	Boston.
CHENEY, ANSEL J.,	District 1,	Beverly.
CLEVELAND, ERNEST E.,	District 7,	Springfield.
DYER, DAVID H.,	District 6,	Fall River.
MERRIAM, FREDERICK W.,	Districts 3, 4, 9,	Boston.
PENNIMAN, WALTER A.,	District 5,	Worcester.
POPE, LEMUEL (also factories),	District 8,	North Adams.
SPLAINE, HENRY,	District 3,	Boston.

Factory and Workshop Inspectors.

NAME.	Assigned.	Residence.
ATHERTON, ARLON S.,	District 2,	Wakefield.
ATKINSON, HARRY,	District 9,	Natick.
CLERKE, CHARLES S.,	District 9,	Boston.
DAM, CHARLES A.,	District 5,	Worcester.
ELLIS, ROBERT,	District 6,	Fall River.
GRIFFIN, JOHN E.,	Districts 3, 9,	Sharon.
HOITT, JAMES W.,	Districts 2, 3, 9,	Boston.
HOWES, JAMES R.,	District 7,	Holyoke.
MCDONALD, ANGUS H.,	District 1,	Cambridge.
MCKEEVER, WILLIAM J.,	Districts 3, 4,	Cambridge.
PLUNKETT, JOHN H.,	District 9,	Boston.
WASLEY, FRANK C.,	Districts 1, 2,	Lowell.
HALLEY, MARY E.,	District 6,	Lawrence.
NASON, MARY A.,	District 9,	Boston.

Boiler Inspection Department.

Name.	Assigned.	Residence.
McNeill, Joseph H.,	Chief Inspector,	Melrose.
Baxter, Sturgis C.,	District 3,	Boston.
Bushek, Henry,	District 1,	Salem.
DeShazo, James B.,	District 5,	Worcester.
Evans, J. Walter,	District 9,	Cambridge.
Ferguson, Charles,	District 1,	Malden.
Forbush, Franklin L.,	District 9,	Hyde Park.
Hinckley, Frank C.,	Special Duty,	Boston.
Kearney, John B.,	Special Duty,	Boston.
Lovering, Arthur F.,	Districts 7, 8,	Northampton.
Luck, George A.,	District 2,	Cambridge.
Mackintosh, George D.,	District 9,	Boston.
MacRae, John A.,	District 8,	North Adams.
McGrath, John,	District 9,	Boston.
Moran, Edward,	District 2,	Boston.
Morton, Harry E.,	District 2,	Hyde Park.
Ramsay, William W.,	District 5,	Worcester.
Sanborn, Freeman H.,	District 7,	Chicopee.
Simm, Wilbert E.,	District 4,	Somerville.
Sullivan, Herbert A.,	District 6,	Fall River.

Clerks.

Frederick W. Macer, *First.* | Frank K. Hahn, *Second.*

Detective and Fire Inspection Department.

Clerk.

Francis W. Fogarty.

Stenographers.

John I. Adams. | Mary E. Buxton.

Maximillian A. J. Barlow.

Boiler Inspection Department.

Jacob W. Powell.

Lewis P. Fall.
Belle C. Davis.
Mary M. Kane, *Worcester Office.*
Sarah A. Carman, *Fall River Office.*
Margaret C. Power, *Salem Office.*
Nellie M. Quinn, *Springfield Office.*

Storehouse.

Terrence McSweeney, *Keeper.*

Assignments of Districts, Inspection Department.

The following assignments of districts to members of the inspection department are now in force: —

DISTRICT NO. 1—ESSEX COUNTY.

Amesbury	Lawrence	North Andover
Andover	Lynn	Peabody
Beverly	Lynnfield	Rockport
Boxford	Manchester	Rowley
Danvers	Marblehead	Salem
Essex	Merrimac	Salisbury
Georgetown	Methuen	Saugus
Gloucester	Middleton	Swampscott
Groveland	Nahant	Topsfield
Hamilton	Newbury	Wenham
Haverhill	Newburyport	West Newbury
Ipswich		

BRANCH OFFICE—SALEM.

Ansel J. Cheney, *Building Inspector.*

Richard S. Beyer, *Building Inspector.*

All cities and towns in Essex County.

Angus H. McDonald, *Factory Inspector.*

All cities and towns in Essex County, excepting Methuen, Lawrence and Andover.

DISTRICT NO. 2—MIDDLESEX COUNTY.

Acton	Bedford	Cambridge
Arlington	Belmont	Carlisle
Ashby	Billerica	Chelmsford
Ashland	Boxborough	Concord
Ayer	Burlington	Dracut

Dunstable	Maynard	Sudbury
Everett	Medford	Tewksbury
Framingham	Melrose	Townsend
Groton	Natick	Tyngsborough
Holliston	Newton	Wakefield
Hopkinton	North Reading	Waltham
Hudson	Pepperell	Watertown
Lexington	Reading	Wayland
Lincoln	Sherborn	Westford
Littleton	Shirley	Weston
Lowell	Somerville	Wilmington
Malden	Stoneham	Winchester
Marlborough	Stow	Woburn

CENTRAL OFFICE—STATE HOUSE.

Charles E. Burfitt, *Building Inspector.*

Horace F. Ball, *Building Inspector.*

All cities and towns in Middlesex County.

Arlon S. Atherton, *Factory Inspector.*

Acton	Hopkinton	Sherborn
Arlington	Hudson	Somerville
Ashland	Lexington	Stoneham
Bedford	Lincoln	Stow
Belmont	Malden	Sudbury
Boxborough	Marlborough	Wakefield
Burlington	Maynard	Waltham
Cambridge	Medford	Wayland
Carlisle	Melrose	Weston
Concord	Natick	Wilmington
Everett	North Reading	Winchester
Framingham	Reading	Woburn
Holliston		

BRANCH OFFICE—LOWELL.

Frank C. Wasley, *Factory Inspector.*

Andover	Dracut	Shirley
Ashby	Dunstable	Tewksbury
Ayer	Groton	Townsend
Billerica	Littleton	Tyngsborough
Carlisle	Lowell	Westford
Chelmsford	Pepperell	

Also Lawrence, Andover and Methuen, in Essex County.

DISTRICT NO. 3—NORFOLK COUNTY.

Avon	Holbrook	Quincy
Bellingham	Hyde Park	Randolph
Braintree	Medfield	Sharon
Brookline	Medway	Stoughton
Canton	Millis	Walpole
Cohasset	Milton	Wellesley
Dedham	Needham	Westwood
Dover	Norfolk	Weymouth
Foxborough	Norwood	Wrentham
Franklin	Plainville	

CENTRAL OFFICE—STATE HOUSE.

Henry J. Bardwell, *Building Inspector.*

All cities and towns in Norfolk County, excepting Cohasset; also Bristol, Dukes and Nantucket counties.

Henry Splaine, *Building Inspector.*

All cities and towns in Norfolk County, excepting Cohasset.

William J. McKeever, *Factory Inspector.*

All cities and towns in Norfolk County, excepting Brookline, Canton, Hyde Park, Needham, Sharon and Wellesley; also Barnstable and Plymouth counties.

DISTRICT NO. 4—PLYMOUTH AND BARNSTABLE COUNTIES.

Plymouth County.

Abington	Hingham	Pembroke
Bridgewater	Hull	Plymouth
Brockton	Kingston	Plympton
Carver	Lakeville	Rochester
Duxbury	Marion	Rockland
East Bridgewater	Marshfield	Scituate
Halifax	Mattapoisett	Wareham
Hanover	Middleborough	West Bridgewater
Hanson	Norwell	Whitman

Barnstable County.

Barnstable	Brewster	Dennis
Bourne	Chatham	Eastham

Falmouth	Orleans	Truro
Harwich	Provincetown	Wellfleet
Mashpee	Sandwich	Yarmouth

CENTRAL OFFICE — STATE HOUSE.

Frederick W. Merriam, *Building Inspector.*

Edwin Y. Brown, *Building Inspector.*

All cities and towns in the two foregoing counties; also Cohasset in Norfolk, and Chelsea, Revere and Winthrop in Suffolk counties.

William J. McKeever, *Factory Inspector.*

All cities and towns in the two foregoing counties; also Norfolk County, excepting Brookline, Canton, Hyde Park, Needham, Sharon and Wellesley.

DISTRICT NO. 5 — WORCESTER COUNTY.

Ashburnham	Hopedale	Rutland
Athol	Hubbardston	Shrewsbury
Auburn	Lancaster	Southborough
Barre	Leicester	Southbridge
Berlin	Leominster	Spencer
Blackstone	Lunenburg	Sterling
Bolton	Mendon	Sturbridge
Boylston	Milford	Sutton
Brookfield	Millbury	Templeton
Charlton	New Braintree	Upton
Clinton	North Brookfield	Uxbridge
Dana	Northborough	Warren
Douglas	Northbridge	Webster
Dudley	Oakham	West Boylston
Fitchburg	Oxford	West Brookfield
Gardner	Paxton	Westborough
Grafton	Petersham	Westminster
Hardwick	Phillipston	Winchendon
Harvard	Princeton	Worcester
Holden	Royalston	

BRANCH OFFICE — WORCESTER.

Walter A. Penniman, *Building Inspector.*

Charles Adams, *Building Inspector.*

Charles A. Dam, *Factory Inspector.*

All cities and towns in Worcester County.

DISTRICT NO. 6—BRISTOL, DUKES AND NANTUCKET COUNTIES.

BRISTOL COUNTY.

Acushnet	FALL RIVER	Rehoboth
Attleborough	Freetown	Seekonk
Berkley	Mansfield	Somerset
Dartmouth	NEW BEDFORD	Swansea
Dighton	North Attleborough	TAUNTON
Easton	Norton	Westport
Fairhaven	Raynham	

DUKES COUNTY.

Chilmark	Gay Head	West Tisbury
Cottage City	Gosnold	
Edgartown	Tisbury	

NANTUCKET COUNTY.

Nantucket

BRANCH OFFICE—FALL RIVER.

HENRY J. BARDWELL, *Building Inspector.*

All cities and towns in Bristol, Dukes and Nantucket counties; also all cities and towns in Norfolk County, excepting Cohasset.

DAVID H. DYER, *Building Inspector.*

ROBERT ELLIS, *Factory Inspector.*

MARY E. HALLEY, *Factory Inspector.*

All cities and towns in Bristol, Dukes and Nantucket counties.

DISTRICT NO. 7—HAMPDEN AND HAMPSHIRE COUNTIES.

HAMPDEN COUNTY.

Agawam	Holland	Southwick
Blandford	HOLYOKE	SPRINGFIELD
Brimfield	Longmeadow	Tolland
Chester	Ludlow	Wales
CHICOPEE	Monson	West Springfield
East Longmeadow	Montgomery	Westfield
Granville	Palmer	Wilbraham
Hampden	Russell	

HAMPSHIRE COUNTY.

Amherst	Greenwich	Prescott
Belchertown	Hadley	South Hadley
Chesterfield	Hatfield	Southampton
Cummington	Huntington	Ware
Easthampton	Middlefield	Westhampton
Enfield	NORTHAMPTON	Williamsburg
Goshen	Pelham	Worthington
Granby	Plainfield	

BRANCH OFFICE—SPRINGFIELD.

ERNEST E. CLEVELAND, *Building Inspector.*

JAMES R. HOWES, *Factory Inspector.*

All cities and towns in Hampden and Hampshire counties.

DISTRICT NO. 8—BERKSHIRE AND FRANKLIN COUNTIES.

BERKSHIRE COUNTY.

Adams	Lanesborough	Richmond
Alford	Lee	Sandisfield
Becket	Lenox	Savoy
Cheshire	Monterey	Sheffield
Clarksburg	Mount Washington	Stockbridge
Dalton	New Ashford	Tyringham
Egremont	New Marlborough	Washington
Florida	NORTH ADAMS	West Stockbridge
Great Barrington	Otis	Williamstown
Hancock	Peru	Windsor
Hinsdale	PITTSFIELD	

FRANKLIN COUNTY.

Ashfield	Greenfield	Orange
Bernardston	Hawley	Rowe
Buckland	Heath	Shelburne
Charlemont	Leverett	Shutesbury
Colrain	Leyden	Sunderland
Conway	Monroe	Warwick
Deerfield	Montague	Wendell
Erving	New Salem	Whately
Gill	Northfield	

BRANCH OFFICE—NORTH ADAMS.

LEMUEL POPE, *Building and Factory Inspector.*

All cities and towns in Berkshire and Franklin counties.

DISTRICT NO. 9—SUFFOLK COUNTY.

Boston Chelsea Revere Winthrop

CENTRAL OFFICE—STATE HOUSE.

FIRST SECTION. Harry Atkinson, *Factory Inspector.*

Boston, southerly of the following line: commencing at Brookline line, centre of Huntington Avenue to Tremont Street, centre of Tremont Street to Pleasant Street, centre of Pleasant Street to Broadway, centre of Broadway to Fort Point Channel; also South Boston, Dorchester, New Dorchester, Mattapan, Roxbury, Jamaica Plain, Roslindale and West Roxbury.

Dorchester Bay, centre of Neponset River, Hyde Park line, Charles River and Brookline being the boundaries on the easterly, southerly and westerly sides.

SECOND SECTION. James W. Hoitt, *Factory Inspector.*

Boston, commencing at Brookline line at Huntington Avenue, centre of Huntington Avenue to Tremont Street, centre of Tremont Street to Court Street, centre of Court Street to Cambridge Street, centre of Cambridge Street to Charles River. All of Boston north and west of this line excepting Charlestown; also Newton and Watertown in Middlesex County and Brookline, Needham and Wellesley in Norfolk County.

THIRD SECTION. Charles S. Clerke, *Factory Inspector.*

Boston, commencing at the centre of Hanover Street at Court Street, centre of Hanover Street to Chelsea Ferry, along the water front to centre of Charles River, to West Boston bridge, to Cambridge Street, centre of Cambridge and Court streets to Hanover Street; also Charlestown.

FOURTH SECTION. John E. Griffin, *Factory Inspector.*

Boston, commencing at the centre of Tremont Street at Pleasant Street, centre of Tremont Street to School Street, centre of School and Water streets to Oliver Street, centre of Oliver Street to Fort Point Channel, centre of Fort Point Channel to Broadway bridge, centre of Broadway and Pleasant Street to Tremont Street; also the towns of Sharon, Canton and Hyde Park in Norfolk County.

FIFTH SECTION. JOHN H. PLUNKETT, *Factory Inspector.*

BOSTON, commencing at the centre of Tremont Street at School Street, centre of Tremont and Court streets to Hanover Street, centre of Hanover Street to Chelsea Ferry, East Boston to the harbor line, and centre of Fort Point Channel to Oliver Street, centre of Oliver, Water and School streets to Tremont Street; also the city of CHELSEA and towns of Revere and Winthrop.

MARY A. NASON, *Inspector,* Central Office, State House.

In connection with other inspection duties, is detailed for the enforcement of the laws relating to the employment of women and children in workshops and mercantile establishments.

MARY E. HALLEY, *Inspector,* Fall River, Mass.

In connection with other inspection duties, is detailed for the enforcement of the laws relating to the employment of women and children in factories and workshops.

BOILER INSPECTORS.

JOSEPH H. McNEILL, *Chief Inspector.*

DISTRICT NO. 1—ESSEX COUNTY.

HENRY BUSHEK, *Inspector,* Branch Office, 12 Kinsman Block, Salem.

Amesbury	Hamilton	NEWBURYPORT
BEVERLY	HAVERHILL	North Andover
Boxford	Ipswich	Rockport
Danvers	Manchester	Rowley
Essex	Marblehead	Salisbury
Georgetown	Merrimac	Topsfield
GLOUCESTER	Middleton	Wenham
Groveland	Newbury	West Newbury

CHARLES FERGUSON, *Inspector,* Branch Office, 12 Kinsman Block, Salem.

LYNN	Peabody	Saugus
Lynnfield	SALEM	Swampscott
Nahant		

Also Revere and Winthrop in Suffolk County.

DISTRICT NO. 2—MIDDLESEX COUNTY.

EDWARD MORAN, *Inspector,* Branch Office, 66 Central Block, Lowell.

Ashby	Dunstable	Shirley
Ayer	Groton	Tewksbury
Billerica	Littleton	Townsend
Carlisle	LOWELL	Tyngsborough
Chelmsford	North Reading	Westford
Dracut	Pepperell	Wilmington

Also Andover, LAWRENCE and Methuen in Essex County.

HARRY E. MORTON, *Inspector,* Central Office, Room 3, State House.

EVERETT	MELROSE	Stoneham
MALDEN	Reading	Wakefield
MEDFORD	SOMERVILLE	

Also Charlestown (except the water front) and CHELSEA in Suffolk County.

GEORGE A. LUCK, *Inspector,* Central Office, Room 3, State House.

Acton	Concord	WALTHAM
Arlington	Hudson	Watertown
Bedford	Lexington	Wayland
Belmont	Lincoln	Weston
Boxborough	Maynard	Winchester
Burlington	Stow	WOBURN
CAMBRIDGE	Sudbury	

DISTRICT NO. 3 — NORFOLK COUNTY.

STURGIS C. BAXTER, *Inspector,* Central Office, Room 3, State House.

All cities and towns in Norfolk County, and the following cities and towns in Middlesex County: —

Ashland	Hopkinton	NEWTON
Framingham	MARLBOROUGH	Sherborn
Holliston	Natick	

Also Hingham and Hull in Plymouth County.

DISTRICT NO. 4 — PLYMOUTH AND BARNSTABLE COUNTIES.

WILBERT E. SIMM, *Inspector,* Branch Office, Hudner Building, Fall River.

All of Barnstable County; all of Plymouth County with the exception of Hingham and Hull; and Acushnet, Fairhaven and NEW BEDFORD in Bristol County.

DISTRICT NO. 5 — WORCESTER COUNTY.

JAMES B. DESHAZO, *Inspector,* Branch Office, 476 Main Street, Worcester.

Auburn	Charlton	Grafton
Blackstone	Douglas	Hopedale
Brookfield	Dudley	Leicester

Mendon	Oxford	Upton
Milford	Southbridge	Uxbridge
Millbury	Spencer	Warren
Northbridge	Sturbridge	Webster
North Brookfield	Sutton	West Brookfield

Also the city of WORCESTER south of Shrewsbury, Front and Pleasant streets.

WILLIAM W. RAMSAY, *Inspector,* Branch Office, 476 Main Street, Worcester.

Ashburnham	Holden	Princeton
Athol	Hubbardston	Royalston
Barre	Lancaster	Rutland
Berlin	Leominster	Shrewsbury
Bolton	Lunenburg	Southborough
Boylston	New Braintree	Sterling
Clinton	Northborough	Templeton
Dana	Oakham	Westborough
FITCHBURG	Paxton	West Boylston
Gardner	Petersham	Westminster
Hardwick	Phillipston	Winchendon
Harvard		

Also city of WORCESTER north of Shrewsbury, Front and Pleasant streets.

DISTRICT NO. 6—BRISTOL, DUKES AND NANTUCKET COUNTIES.

HERBERT A. SULLIVAN, *Inspector,* Branch Office, Hudner Building, Fall River.

All cities and towns in Bristol County with the exception of Acushnet, Fairhaven and NEW BEDFORD; also Dukes and Nantucket counties.

DISTRICT NO. 7—HAMPDEN AND HAMPSHIRE COUNTIES.

FREEMAN H. SANBORN, *Inspector,* Branch Office, 21 Besse Place, Springfield.

All cities and towns in Hampden County with the exception of HOLYOKE.

ARTHUR F. LOVERING, *Inspector,* Branch Office, Masonic Building, Northampton.

All cities and towns in Hampshire County; HOLYOKE in Hampden County, and the following towns in Franklin County: —

Erving	Northfield	Sunderland
Leverett	Orange	Warwick
Montague	Shutesbury	Wendell
New Salem		

DISTRICT NO. 8 — BERKSHIRE AND FRANKLIN COUNTIES.

JOHN A. MACRAE, *Inspector,* Branch Office, Kimbell Block, North Adams.

All cities and towns in Berkshire County, and the following towns in Franklin County: —

Ashfield	Deerfield	Leyden
Bernardston	Gill	Monroe
Buckland	Greenfield	Rowe
Charlemont	Hawley	Shelburne
Colrain	Heath	Whately
Conway		

DISTRICT NO. 9 — SUFFOLK COUNTY.

GEORGE D. MACKINTOSH, *Inspector,* Central Office, Room 3, State House.

BOSTON proper, bounded by Causeway Street, Commercial Street, Atlantic Avenue, Essex Street, Boylston Street, Massachusetts Avenue to Charles River, and Charles River to Warren Bridge.

FRANKLIN L. FORBUSH, *Inspector,* Central Office, Room 3, State House.

BOSTON proper and South Boston, bounded by Summer Street Extension, Atlantic Avenue, Essex Street, Boylston Street, Massachusetts Avenue, Columbia Road to the water front.

JOHN MCGRATH, *Inspector,* Central Office, Room 3, State House.
BOSTON, south of Massachusetts Avenue and Columbia Road, including: —

Allston	Jamaica Plain	Roxbury
Brighton	Mattapan	West Roxbury
Dorchester	Roslindale	

J. WALTER EVANS, *Inspector,* Central Office, Room 3, State House.
East Boston and the water front, from Mystic Bridge in Charlestown to Summer Street Extension, including Charles River to Brookline Street Bridge; also Boston Harbor and the islands therein.

FRANK C. HINCKLEY, *Special Duty,* Central Office, Room 3, State House.

JOHN B. KEARNEY, *Special Duty,* Central Office, Room 3, State House.

In Memoriam.

On March 25, 1908, Capt. Samuel L. Ryan, a member of this department, was mustered out by death.

Born in Waltham, May 21, 1844, he received his education in the public schools of that town. He shared in the intense public excitement in the north, caused by the firing upon Fort Sumter, and as soon as his seventeenth birthday had passed he repeatedly endeavored to enlist in the service of his country. On Dec. 16, 1861, he succeeded by enlisting in the First Regiment Massachusetts Cavalry, then encamped at Readville; but four days later he was rejected, in consequence of not being of the regulation height. Shortly after he succeeded in enlisting in the Thirtieth Massachusetts Volunteers, being assigned to Company I. Oct. 18, 1862, he was promoted corporal, and the following April he was promoted sergeant. In 1863 he was transferred to the 73d United States Volunteers, and October 27 of the same year was promoted to second lieutenant, and the following February he was promoted to first lieutenant. March 7, 1865, for bravery in the field, he was made captain, being but twenty years of age at the time. He was mustered out in the fall of 1865. In 1899 he entered the service of the Commonwealth as a messenger in the civil service department, and on Aug. 23, 1903, he was transferred to this department and appointed an inspector of factories and public buildings, in which position he remained until his death. He was a brave soldier, a good citizen and a faithful officer.

On May 18, 1908, at midnight, Inspector John J. Sheehan, a respected member of this department, passed away at his home, 400 Essex Street, Salem, after an illness of less than one hour's duration. He had attended a meeting of the School Board, of which he was a member, and had taken an

active interest in matters coming before the Board; his last official act being to vote in favor of increasing the salaries of the teachers, a measure he had the satisfaction of seeing enacted before he passed to the great beyond.

He was born in Liverpool, Eng., Sept. 16, 1846, coming to Salem when he was twelve years of age. He received his education in the public schools of Salem. When he was but ten years old his father died, and, being the eldest child, much of the responsibility that had been borne by his father devolved upon him, and, young as he was, he assisted his mother to keep her family together by doing chores after school.

On July 15, 1864, he enlisted in Company I, Sixth Regiment Massachusetts Volunteer Militia. After serving his term of enlistment he returned to Salem. On March 21, 1891, he was appointed a member of the inspection department by Governor Russell, and performed the varied duties of his office with credit to himself and honor to the Commonwealth. He was a member of Union Post 5, Peabody, G. A. R., and was high in the esteem of his comrades.

The Department.

The department, as at present constituted, consists of: —

The Chief, who is in charge of the entire department.

The detective and fire inspection department, consisting of one deputy chief; one chief fire inspector; one captain, assigned to the command of the State steamer "Lexington" when in commission to enforce the fishing laws; fourteen detective officers and six fire inspectors.

The inspection department, consisting of one deputy chief; one chief inspector of boilers; thirteen inspectors of public buildings; fourteen inspectors of factories and workshops (two being females) and nineteen inspectors of boilers, who are also the examiners of applicants for engineers' and firemen's licenses.

The clerical assistance, consisting of one first and one second clerk, under the immediate orders of the Chief; one

clerk and three stenographers of the detective and fire inspection department; seven clerks of the boiler inspection department, three being employed in the Boston office and one in each of the four branch offices at Fall River, Salem, Springfield and Worcester, respectively. One of the three clerks in the Boston office also acts as secretary to the Board of Boiler Rules, as provided by section 25, chapter 465, Acts of 1907.

In addition it has been found necessary, during a considerable portion of the year, to employ temporary clerical assistance.

Recommendations.

I would respectfully state that the effective fulfilment of the many and varied duties entailed upon this department by the respective acts of Legislature is impossible, with the present force, and I deem it my duty to make the following recommendations, and to state that a larger increase in the force than is recommended is an actual necessity, although the additions recommended would materially assist in the carrying out of the increased work placed upon the department.

There has been a constant increase in the work of each department during the past two years, and it has been found impossible, with the present number of officers in the fire inspection department and the factory and public building inspection department, to properly carry out the necessary work of those departments. During the year 1907 the number of fires in the city of Boston was 1,917, and the number in the State, exclusive of Boston, was 3,877, a total of 5,794, being an increase over the previous year of 972, or 20 per cent.; the record for the present year shows a continued increase. In consequence of this increase in the amount of work to be performed by the fire inspection department, it has been found necessary to detail two officers of the detective department to assist in such work, thus materially impairing the efficiency of the detective department, which at the present time is inadequate to perform the duties imposed upon it.

I would respectfully recommend that two additional inspectors be appointed to the fire inspection department.

I would also recommend that two additional inspectors be appointed to the inspection department, as inspectors of factories and public buildings. At the present time I am unable to detail an inspector of factories for the district covering Berkshire and Franklin counties, the duties in connection with such position being performed, in so far as is possible, by the inspector of public buildings for that district; but, as the duties of his position as an inspector of public buildings are such as to occupy his entire time, any duties he may perform in connection with the inspection of factories necessarily results in compelling him to omit some portion of his duties as an inspector of public buildings. One of the inspectors herein recommended, if appointed, would be detailed for duty in that district.

The second inspector recommended, if appointed, would be detailed for special duty in the Boston office, where the additional increase of work renders the services of an additional inspector imperative.

In my last annual report I recommended the appointment of two stenographers for service as clerks in the inspection department, one to be employed in the office of the deputy chief and one in the office of the inspectors of factories and public buildings. The recommendation, however, was referred to the next General Court by the committee on public affairs.

I am again compelled, by the constant increase of the duties pertaining to the inspection department, to recommend the appointment of two stenographers for service as clerks in such department. The appointment of such clerical assistance to properly record the work of the inspectors, copy reports, write orders, answer correspondence and such other duties as can be more rapidly performed by such means, would result in relieving the inspectors of factories and public buildings of a large amount of clerical work, and enable them to devote the time thus saved to their more important work of actual inspection.

During the year the clerical work has been partially performed by the second clerk of the department, assisted by temporary clerks obtained for such purpose.

Section 1, chapter 522, Acts of 1906, provides as follows: —

> The governor is also hereby authorized to appoint one clerk, at an annual salary of eight hundred dollars, to serve in the said department, and four additional clerks, at an annual salary of six hundred dollars each, to serve at branch offices in the said department.

While an annual salary of six hundred dollars each would appear to be a sufficient compensation for the first year of service of said clerks, it is not, in my opinion, sufficient for the continuous service of an experienced, efficient and faithful clerk, whose conduct has been such as to merit the recommendation of the Chief of the department; and I would respectfully recommend that the compensation of such clerks shall be increased by yearly increments of fifty dollars until it reaches such maximum as may be decided by legislation, provided, however, that such increase is recommended, from year to year, by the Chief of this department, for efficiency and merit.

By the provisions of section 1, chapter 385, Acts of 1908, "An Act relative to the observance of the Lord's day," it became my duty, as Chief of this department, to approve of all licenses granted for public entertainments on the Lord's Day, providing such entertainments are considered by me to be in keeping with the character of the day, and not inconsistent with its due observance.

In obedience to the provisions of this statute, between the seventeenth day of May and the thirty-first day of October, 1908, the mayors of the cities and selectmen of the towns specified in the following list have forwarded me 2,865 licenses, with requests for my approval. Of this number 2,815 were approved by me, and 50 were not approved, for what I consider were just and conclusive reasons: —

LICENSES FOR PUBLIC ENTERTAINMENTS TO BE HELD ON THE LORD'S DAY.

CITY OR TOWN.	Approved.	Not Approved.	CITY OR TOWN.	Approved.	Not Approved.
Auburn,	6	-	Methuen,	11	-
Avon,	75	-	Montague,	19	-
Bedford,	17	-	Nahant,	34	1
Bellingham,	34	1	Nantucket,	25	-
Billerica,	12	-	Natick,	1	-
BOSTON,	311	-	NEW BEDFORD,	2	-
Brookfield,	7	1	Newbury,	11	-
CAMBRIDGE,	1	-	NEWTON,	23	-
CHICOPEE,	5	-	Norwood,	1	-
Dartmouth,	33	1	Palmer,	13	-
Dighton,	24	1	Pembroke,	47	-
Dracut,	83	-	QUINCY,	56	2
FALL RIVER,	106	-	Revere,	784	6
FITCHBURG,	1	-	SALEM,	1	-
Freetown,	6	-	Salisbury,	48	2
GLOUCESTER,	28	-	Shrewsbury,	259	33
Groveland,	15	-	Spencer,	4	-
HAVERHILL,	54	-	TAUNTON,	32	-
Hull,	225	1	Templeton,	8	-
Lanesborough,	16	-	Tyngsborough,	22	-
LAWRENCE,	66	-	Ware,	1	-
Lexington,	17	-	Wareham,	14	-
LOWELL,	1	-	Webster,	25	1
LYNN,	153	-	Westborough,	11	-
Marblehead,	1	-	Westfield,	8	-
MARLBOROUGH,	1	-	Westwood,	10	-
Maynard,	8	-	WORCESTER,	11	-
Mendon,	28	-	Total,	2,815	50

In addition to the above, a large number of persons, intending to apply for licenses in their respective cities or towns, first called upon me from time to time, to ascertain if I would approve of such licenses if forwarded to me, advising me in detail of the nature of the public entertainment for which license would be requested. As, in my opinion, such public entertainments were not in keeping with the character of the

day, being inconsistent with its due observance, I advised such persons that I could not approve of the licenses, if forwarded to me; in consequence of which advice, the persons referred to did not apply for licenses.

It is a source of considerable gratification to state that, with few exceptions, the municipal authorities have co-operated with this department in the enforcement of this statute.

As shown by the foregoing list, a large amount of additional work has been placed upon this department, together with the necessary expenses connected therewith. The continuous employment of one temporary clerk has been found necessary, whose time has been taken up with the correspondence, filing and other clerical work connected with the licenses forwarded to me for approval; and at frequent intervals it has been found necessary to employ additional assistance for such purpose. There have also been other incidental expenses connected with this work.

By reference to the foregoing list it will also be noted that a large proportion of the cities and towns of this Commonwealth have not been called upon to grant licenses for public entertainments on the Lord's Day, although they have necessarily been called upon to bear their portion of the expense incurred by the Commonwealth in carrying out the provisions of the statute.

I feel it incumbent upon me to recommend, in order to meet the expenses above referred to, that a fee of $1 be paid by the licensee for each license sent to me for approval, such fee to accompany the license when forwarded to this department.

Since the passage of chapter 176, Acts of 1905, being "An Act to regulate the use of the cinematograph," to Oct. 31, 1908, 720 cinematographs, or other similar apparatus, have been inspected, approved and tagged with a metal tag by this department; a large number has also been inspected upon which approval has been refused.

In compliance with the provisions of chapter 566, Acts of 1908, being "An Act relative to the use of the cinematograph," from Aug. 7 to Oct. 31, 1908, 557 applicants have been examined for license to operate any cinematograph or

similar apparatus involving the use of a combustible film more than ten inches in length. Of this number, 380 passed the examination and were granted licenses, the remaining 177 failed to pass. In section 4 of this statute provision has been made for a fee of $3 to be paid for the license, which would seem to cover the necessary expense incurred in connection with the examination of such applicants as are granted licenses; but no provision is made in said statute to meet the expense incurred in connection with the examination of applicants who fail to pass, and, therefore, receive no license. It is also to be noted that this fact results in such persons making application for re-examination a number of times, which would not occur if a fee was necessary with each application. From these facts it can readily be seen that the Commonwealth is put to considerable expense by the repeated attempts of unsuccessful applicants to obtain a license, in consequence of the wear and tear of the apparatus, the furnishing of the necessary supplies of electricity and working materials, and the time of the inspectors making such examinations.

I would therefore recommend that the statute be so amended that each applicant, whether successful or otherwise, shall pay a fee of $3, the same to accompany the application for examination.

I would also recommend that said statute be so amended that a fee of $1 shall be paid for each permit as an assistant to a licensed operator of a cinematograph or similar apparatus, in accordance with the provisions of section 5 of said statutes; and that a fee of $1 shall be paid by the owner, user or exhibitor of each cinematograph or other similar apparatus inspected, approved and tagged by this department.

In my annual report for 1907 I drew attention to the fact that, after the transfer from this department to the State Board of Health of the jurisdiction over the sanitation and ventilation of old buildings designed to be used in whole or in part as public buildings, public or private institutions, schoolhouses, churches, theatres, public halls, places of assemblage or places of public resort, the plans in connection with such old buildings, submitted for approval to this department, were referred to the State Board of Health, this depart-

ment having been relieved from the oversight of that part of the law relating to ventilation and sanitation. The plans thus referred were returned to this department, it being claimed that the State Board of Health had nothing to do in reference to plans connected with the remodelling of old buildings.

I would again respectfully request that this matter be brought before the Legislature, in order that it may be clearly defined whose duty it shall be to approve plans for the remodelling of such old buildings.

Regulations governing the Granting of Licenses for Public Halls, under Chapter 105 of the Acts of the Year 1906.

There must be at least two proper and distinct exits, aggregating not less than 20 inches in width for every 100 persons of the total number permitted to be in the hall at one time.

All exit doors must open outwardly, and, where necessary for doors to be fastened, the standing leaf of each pair of doors must be provided with double bolts with T turn of convenient height, or a top bolt with T turn or projecting pull within 4 feet 6 inches of the floor, and all other bolts must be removed; and the single doors, where necessary for them to be fastened, must be equipped with night latches with knob, and all dead locks must be removed. All bolts and locks must be arranged for operation from the inside of the hall.

All exits must be plainly marked, and lighted when audience is in the building.

All stairs must be railed on each side.

All aisles, passageways and exits must be kept free and unobstructed at all times when said hall is occupied.

The stage and audience hall must be equipped with approved standpipe and hose or fire extinguishers, and said apparatus must be kept in good order and ready for instant use.

If scenery and other stage appliances are used, a fire-resisting partition or other safeguard satisfactory to the licensor must be provided, and the proscenium opening equipped with an approved asbestos curtain properly hung. Said curtain must be raised immediately before the com-

mencement and lowered at the close of every performance given in the hall.

If at any time scenery is employed in a hall not provided with a stage, in which a mere platform is utilized in place of a stage, said scenery must be constructed of fireproof material, or treated with so-called fireproof paint or other suitable means of preventing combustion.

Specification for Fire-escape, with Balconies from 4 Feet 3 Inches to 5 Feet 3 Inches in Width and Stairs from 2 Feet to 2 Feet 6 Inches in Width.

The fire-escape to be of iron or steel, with balconies at each story above the first, and in no case the balconies to be more than 9 inches below the top of the door or window sills with which they connect. Wherever circumstances will permit, the stairs to be on the outside of the balconies, with equal width passageway next to the building and a 3-inch hand space between the same.

The brackets to be not more than 4 feet apart. The top member of main brackets to be 2½ inches by 3 inches T, with 1-inch bolt extending through the wall, with nut and not less than 5-inch washer inside; the brace to be 1 inch round or square, or 2½ inches by 2½ inches T, securely bolted or riveted at top and entering the wall at least 4 inches at bottom, with a shoulder resting on a heavy washer. The brackets in passageways to be similar, with 1-inch bolt passing through the wall with nut and not less than 5-inch washer inside, or their approved equivalent.

The floors of the balconies to be of 1¼-inch by ¼-inch bars, set on edge, 1½ inches on centers, stayed by separator bolts at least every 2 feet, and securely bolted to brackets. Extra bearing-pieces to be put in wherever circumstances require.

The stairs, when practicable, to have an incline not greater than 45°. The stringers to be not less than 5 inches by ⅜ inch in size, well secured to the brackets at top and bottom, provided with suitable angles or brackets to support the treads, and properly braced. The treads to be 1¼-inch by ¼-inch bars, set on edge, with two separator bolts, not less than 7½ inches wide, and securely bolted in place. The rise

not to exceed 9 inches. The stairs must in all cases descend to the ground, except where the fire-escape projects over a highway or driveway the lower balcony may connect with approved cantalever stairs, or folding ladder, when approved by the inspector.

Two inches above the rear of the treads, a ⅝-inch iron rod to extend through from stringer to stringer, one end of each rod to be properly headed, and the other securely fastened with screw and nut on outside of stringer, this to prevent feet slipping off at rear of tread.

The balustrades of balconies and each side of stairs to have hand rail 1½ inches by ⅜ inch in size, set flat-wise, or 1¼-inch by 1¼-inch angle, not less than 3 feet in height above the floor or front of treads, and well secured to walls and posts. The filling to be ⅝-inch round or square uprights not more than 8 inches apart, or any approved flat, cross or fancy work equivalent. The balustrades to be well braced at least every 6 feet.

All fire-escapes to be painted two coats, the first coat to be pure red lead and linseed oil. The second coat not to be put on until after the work has been inspected and approved by this department.

All material used to be the best of their several kinds, and all the work to be done in the most workmanlike manner. Wherever deemed necessary, the walls to be re-enforced as the inspector directs.

Note. — For fire-escapes with stairs more than 2 feet 6 inches in width, the plans and specifications must be submitted to the inspector and approved by him before the escape is constructed.

Acts and Amendments passed.

Chapter 389, Acts of 1908.

An Act to define the powers and duties of the inspectors of factories and public buildings.

Be it enacted, etc., as follows:

Section 1. The chief of the district police, the deputy chief of the inspection department of the district police, and the inspectors of factories and public buildings may, in the performance of their duty in enforcing the laws of the commonwealth, enter any building,

structure or enclosure, or any part thereof, and examine the methods of prevention of fire, means of exit, and means of protection against accident, and may make investigations as to the employment of children, young persons and women, except concerning health and the influence of occupation upon health. They may, except in the city of Boston, enter any public building, public or private institution, schoolhouse, church, theatre, public hall, place of assemblage, or place of public resort, and make such investigations and order such structural or other changes, in said buildings, as are necessary relative to the construction, occupation and heating appliances and conditions, except for ventilating and sanitary purposes: *provided, however,* that they may order structural changes for any purpose whenever the necessity therefor has been reported in accordance with the provisions of section five of chapter five hundred and thirty-seven of the acts of the year nineteen hundred and seven.

Section 2. Any person who hinders or prevents or attempts to prevent any member of the inspection department of the district police from entering any building, structure or enclosure or part thereof specified in the preceding section shall be liable to a penalty of not less than fifty nor more than one hundred dollars.

Section 3. Trial justices, police, municipal and district courts shall have concurrent jurisdiction with the superior court to enforce the provisions of this act. [*Approved April 11, 1908.*

Chapter 221, Acts of 1908.

An Act relative to the inspection of buildings.

Be it enacted, etc., as follows:

Section 1. Section four of chapter one hundred and four of the Revised Laws is hereby amended by striking out the word "eight", in the second line, and inserting in place thereof the word: — six, — so as to read as follows: — *Section 4.* In a city or town which accepts the provisions of this and the six following sections or has accepted the corresponding provisions of earlier laws, the superintendent of public buildings or such other officer as the mayor and aldermen of said city or the selectmen of said town may designate shall be inspector of buildings, and, immediately upon being informed by report or otherwise that a building or other structure or anything attached to or connected therewith in said city or town is unsafe or dangerous to life or limb, shall inspect the same; and if it appears to him to be dangerous, he shall forthwith in writing notify the owner, agent or any person having an interest therein to remove it or make it safe and secure. If it appears that such structure would be specially unsafe in case of fire, it shall be deemed dangerous within the meaning hereof, and the inspector may affix in a conspicuous place upon its exterior walls a notice of its dan-

gerous condition, which shall not be removed or defaced without authority from him.

SECTION 2. This act shall take effect upon its passage. [*Approved March 14, 1908.*

CHAPTER 335, ACTS OF 1908.

AN ACT RELATIVE TO THE USE OF BUILDINGS AS THEATRES AND PUBLIC HALLS.

Be it enacted, etc., as follows:

SECTION 1. No person shall occupy or use any building or part thereof as a theatre, public hall, place of public entertainment or assemblage, or place of public resort until a license therefor has been obtained from the chief of the district police, or a certificate therefor from an inspector of factories and public buildings. Such license or certificate shall be posted in a conspicuous place near the main entrance to such theatre, hall, room or building. Any person violating any provision of this section shall be punished by a fine of not less than twenty-five nor more than one thousand dollars.

SECTION 2. Any licensee who violates the conditions of a license granted by the chief of the district police in accordance with the provisions of chapter four hundred and fifty of the acts of the year nineteen hundred and four, of chapter three hundred and forty-two of the acts of the year nineteen hundred and five, or of chapter one hundred and five of the acts of the year nineteen hundred and six, may be punished by a fine of not less than twenty-five nor more than one thousand dollars, or by imprisonment for not more than one year, and his license may be revoked as provided in said chapters.

SECTION 3. Police, district and municipal courts shall have jurisdiction of prosecutions and proceedings at law under the provisions of this act, concurrently with the superior court.

SECTION 4. This act shall not apply to the city of Boston. [*Approved April 1, 1908.*

CHAPTER 487, ACTS OF 1908.

AN ACT RELATIVE TO APPEALS FROM THE ORDERS OF THE INSPECTORS OF FACTORIES AND PUBLIC BUILDINGS OF THE DISTRICT POLICE.

Be it enacted, etc., as follows:

SECTION 1. Whoever is aggrieved by the order, requirement, or direction of an inspector of factories and public buildings may, within ten days after the service thereof, appeal to a judge of the superior court for the county in which the building to which such order, requirement or direction relates is situated, for an order forbidding its enforcement; and after such notice as said court shall order to all parties interested, a hearing may be had before said

court at such early and convenient time and place as shall be fixed by said order: or the court may appoint three disinterested persons, skilled in the subject-matter of the controversy, to examine the matter and hear the parties: and the decision of said court, or the decision, in writing and under oath, of the majority of said experts, filed in the office of the clerk of courts in said county within ten days after such hearing, may alter, annul or affirm such order, requirement or direction. Such decision or a certified copy thereof shall have the same authority, force and effect as the original order, requirement or direction of the inspector. If such decision annuls or alters such order, requirement or direction of the inspector, the court shall also order the said inspector not to enforce his order, requirement or direction, and in every case the certificate required by law shall thereupon be issued by said court or by said experts.

Section 2. The court may award reasonable compensation to experts appointed under the provisions of the preceding section which, if the order, requirement or direction of the inspector is altered or annulled, shall be paid by the county in which the application for an order of the court was made; otherwise, by the applicant. If the order, requirement or direction of the inspector is affirmed by the court or the experts, costs shall be taxed against the applicant for the order of the court as in civil cases, and shall be paid into the treasury of the county in which the application for such order of the court was made.

Section 3. Sections nineteen and twenty of chapter one hundred and four of the Revised Laws, chapter four hundred and ninety-nine of the acts of the year nineteen hundred and seven, and all acts and parts of acts inconsistent herewith, are hereby repealed.

Section 4. This act shall take effect upon its passage. [*Approved May 5, 1908.*

Chapter 82, Resolves of 1908.

Resolve to provide for a codification of the laws relating to labor.

Resolved, That the secretary of the commonwealth is hereby directed to codify in one act the laws of the commonwealth relating to labor. He may employ such assistance as may be necessary, may expend a sum not exceeding five hundred dollars, and shall report in print to the next general court. [*Approved May 1, 1908.*

Chapter 645, Acts of 1908.

An Act relative to the hours of labor of women and minors.

Be it enacted, etc., as follows:

Section 1. Section twenty-four of chapter one hundred and six of the Revised Laws, as amended by chapter four hundred and

thirty-five of the acts of the year nineteen hundred and two, is hereby amended by striking out the word "fifty-eight", in the eighth line, and inserting in place thereof the word: — fifty-six, — and also by inserting after the word "week", in said line, the following: — except that in any such establishment where the employment is by seasons, the number of such hours in any week may exceed fifty-six, but not fifty-eight, provided that the total number of such hours in any year shall not exceed an average of fifty-six hours a week for the whole year, excluding Sundays and holidays, — so as to read as follows: — *Section 24.* No child under eighteen years of age and no woman shall be employed in laboring in a manufacturing or mechanical establishment more than ten hours in any one day, except as hereinafter provided in this section, unless a different apportionment of the hours of labor is made for the sole purpose of making a shorter day's work for one day of the week; and in no case shall the hours of labor exceed fifty-six in a week, except that in any such establishment where the employment is by seasons, the number of such hours in any week may exceed fifty-six, but not fifty-eight, provided that the total number of such hours in any year shall not exceed an average of fifty-six hours a week for the whole year, excluding Sundays and holidays. Every employer shall post in a conspicuous place in every room in which such persons are employed a printed notice stating the number of hours' work required of them on each day of the week, the hours of commencing and stopping work, and the hours when the time allowed for meals begins and ends or, in the case of establishments exempted from the provisions of sections thirty-six and thirty-seven, the time, if any, allowed for meals. The printed forms of such notices shall be provided by the chief of the district police, after approval by the attorney-general. The employment of such person at any time other than as stated in said printed notice shall be deemed a violation of the provisions of this section unless it appears that such employment was to make up time lost on a previous day of the same week in consequence of the stopping of machinery upon which he was employed or dependent for employment; but no stopping of machinery for less than thirty consecutive minutes shall justify such overtime employment, nor shall such overtime employment be authorized until a written report of the day and hour of its occurrence and its duration is sent to the chief of the district police or to an inspector of factories and public buildings.

Section 2. This act shall take effect on the first day of January in the year nineteen hundred and ten. [*Approved June 13, 1908.*

CHAPTER 650, ACTS OF 1908.

AN ACT RELATIVE TO THE WEEKLY PAYMENT OF WAGES TO PUBLIC EMPLOYEES.

Be it enacted, etc., as follows:

SECTION 1. Section sixty-two of chapter one hundred and six of the Revised Laws, as amended by chapter four hundred and twenty-seven of the acts of the year nineteen hundred and six, and by chapter one hundred and ninety-three of the acts of the year nineteen hundred and seven, is hereby further amended by inserting after the word "them", in the seventeenth line, the words: — and every person employed by it or them in any penal or charitable institution, — so as to read as follows: — *Section 62.* Every manufacturing, mining, or quarrying, mercantile, railroad, street railway, telegraph or telephone corporation, every incorporated express company or water company, and every contractor, person or partnership engaged in any manufacturing business, in any of the building trades, in quarries or mines, upon public works or in the construction or repair of railroads, street railways, roads, bridges or sewers, or of gas, water or electric light works, pipes or lines, shall pay weekly each employee engaged in his or its business the wages earned by him to within six days of the date of said payment, but any employee leaving his or her employment, or being discharged from such employment, shall be paid in full on the following regular pay day; and the commonwealth, its officers, boards and commissions shall so pay every mechanic, workman and laborer who is employed by it or them, and every person employed by it or them in any penal or charitable institution, and every county and city shall so pay every employee who is engaged in its business the wages or salary earned by him, unless such mechanic, workman, laborer or employee requests in writing to be paid in a different manner; and every town shall so pay each employee in its business if so required by him; but an employee who is absent from his regular place of labor at a time fixed for payment shall be paid thereafter on demand. The provisions of this section shall not apply to an employee of a co-operative corporation or association if he is a stockholder therein unless he requests such corporation to pay him weekly. The board of railroad commissioners, after a hearing, may exempt any railroad corporation from paying weekly any of its employees if it appears to the board that such employees prefer less frequent payments, and that their interests and the interests of the public will not suffer thereby. No corporation, contractor, person or partnership shall by a special contract with an employee or by any other means exempt himself or itself from the provisions of this and the following section. Whoever violates the provisions of this

section shall be punished by a fine of not less than ten nor more than fifty dollars.

SECTION 2. This act shall take effect upon its passage. [*Approved June 13, 1908.*

CHAPTER 385, ACTS OF 1908.

AN ACT RELATIVE TO THE OBSERVANCE OF THE LORD'S DAY.

Be it enacted, etc., as follows:

SECTION 1. Section one of chapter ninety-eight of the Revised Laws, as amended by section one of chapter four hundred and sixty of the acts of the year nineteen hundred and four, is hereby further amended by striking out said section and inserting in place thereof the following: — *Section 1.* Whoever on the Lord's day is present at a game, sport, play or public diversion, except a concert of sacred music or a public entertainment duly licensed as hereinafter provided, or a free open air concert given by a city or town or by license of the mayor of a city, or the selectmen of a town, upon a common or public park, street or square, shall be punished by a fine of not more than five dollars for each offence. The mayor of a city and the selectmen of a town may, except as provided in section forty-six of chapter one hundred and six of the Revised Laws, upon written application describing the proposed entertainment, grant licenses for public entertainments to be held on the Lord's day which shall be in keeping with the character of the day and not inconsistent with its due observance, and to which admission is to be obtained upon payment of money or some other pecuniary or valuable consideration, such license to be issued subject to such terms or conditions as the mayor or selectmen may prescribe: *provided, however,* that no such license shall be granted to have effect before one o'clock in the afternoon, nor unless the proposed entertainment shall be approved in writing by the chief of the district police as being in keeping with the character of the day and as not inconsistent with its due observance. Any such license may, after notice and a hearing given by the mayor or selectmen issuing the same, or by the chief of the district police, be suspended, revoked or annulled by them or him. Whoever offers to view, sets up, establishes, maintains or attempts to set up, establish or maintain, or promotes or assists in such attempt, or promotes, or aids, abets, or participates in offering to view, setting up, establishing or maintaining any public entertainment on the Lord's day, except a concert of sacred music, or free open air concert, as hereinbefore provided, unless such public entertainment shall be in keeping with the character of the day and not inconsistent with its due observance and duly licensed, as herein provided, shall be punished by a fine of not more than five hundred dollars.

SECTION 2. Section one hundred and seventy-two of chapter one hundred and two of the Revised Laws, as amended by section four of chapter four hundred and sixty of the acts of the year nineteen hundred and four, by chapter three hundred and forty-one of the acts of the year nineteen hundred and five, and by chapter two hundred and seventy-four of the acts of the year nineteen hundred and seven, is hereby further amended by striking out said section and inserting in place thereof the following: — *Section 172.* The mayor of a city or the selectmen of a town may, except as provided in section forty-six of chapter one hundred and six of the Revised Laws, grant, upon such terms and conditions as they deem reasonable, a license for theatrical exhibitions, public shows, public amusements and exhibitions of every description to which admission is obtained upon payment of money or upon the delivery of any valuable thing, or by a ticket or voucher obtained for money or any valuable thing, or in which after free admission, amusement is furnished upon a deposit of money in a mechanical device known as the "nickel in the slot" machine or "penny in the slot" machine, or in any other similar machine, and the mayor or selectmen may revoke or suspend such license at their pleasure, but they shall not grant a license for any such theatrical exhibitions, public shows or public amusements or exhibitions of any description whatever to be held upon the Lord's day, except that they may grant licenses for public entertainments to be held on the Lord's day which shall be in keeping with the character of the day and not inconsistent with its due observance, to which admission is obtained upon payment of money or some other pecuniary or valuable consideration, such license to be issued subject to such terms or conditions as the mayor or selectmen may prescribe: *provided, however,* that no such license to be exercised on the Lord's day shall be granted to have effect before one o'clock in the afternoon, nor unless the proposed entertainment shall be approved in writing by the chief of the district police as being in keeping with the character of the day and as not inconsistent with its due observance, and any such license may, after notice and a hearing given by the mayor or selectmen issuing the same, or by the chief of the district police, be suspended, revoked or annulled by them or him, and no such exhibition, show or amusement, except a concert of sacred music or a free open air concert given by a city or town upon a common, public park, street or square, shall be given without such license.

SECTION 3. All acts and parts of acts inconsistent herewith are hereby repealed. [*Approved April 11, 1908.*

CHAPTER 368, ACTS OF 1908.

AN ACT RELATIVE TO THE ADMITTANCE OF MINORS TO CERTAIN PLACES OF AMUSEMENT.

Be it enacted, etc., as follows:

Section one hundred and seventy of chapter one hundred and two of the Revised Laws is hereby amended by inserting after the word "alley", in the second line, the words: — or place in which pictures are displayed upon the deposit of money in a mechanical device known as the nickel-in-the-slot machine or penny-in-the-slot machine, or in any similar device for displaying pictures, — so as to read as follows: — *Section 170.* The keeper of a billiard, pool or sippio room or table or bowling alley, or place in which pictures are displayed upon the deposit of money in a mechanical device known as the nickel-in-the-slot machine or penny-in-the-slot machine, or in any similar device for displaying pictures, who admits a minor thereto without the written consent of his parent or guardian shall forfeit ten dollars for the first and twenty dollars for each subsequent offence. [*Approved April 8, 1908.*

CHAPTER 381, ACTS OF 1908.

AN ACT RELATIVE TO THE USE BY THE PUBLIC OF MUTOSCOPES, LUNG TESTING MACHINES AND SIMILAR APPARATUS.

Be it enacted, etc., as follows:

SECTION 1. It shall be the duty of the proprietor or manager of any place of public amusement or other place in which there are provided for public use and entertainment mutoscopes or any other machine or apparatus of such nature that the person using the same breathes or speaks into it, or, for the purpose of seeing or hearing, holds any part thereof in contact with or near to his eyes or ears, to disinfect the same in such manner as shall be approved by the local board of health at least twice during such hours, in every twenty-four hours, as the machine or apparatus is offered for use by the public. This act shall not apply to telephones.

SECTION 2. It shall be unlawful to provide for public use or entertainment in any place of public amusement or other place of public resort any so-called lung testing machine or similar contrivance, the use of which requires the application of any part thereof to the lips.

SECTION 3. Whoever violates any provision of this act shall be punished by a fine of not more than twenty-five dollars for each offence. [*Approved April 10, 1908.*

CHAPTER 143, ACTS OF 1908.

AN ACT TO AUTHORIZE THE MEMBERS OF THE DISTRICT POLICE TO CARRY BADGES AND WEAPONS.

Be it enacted, etc., as follows:

SECTION 1. The chief of the district police, with the approval of the governor, may authorize the members of the district police to have in possession and carry a badge, revolver, club, billy, handcuffs and twisters or such other articles as may be required in the performance of their official duties.

SECTION 2. This act shall take effect upon its passage. [*Approved February 27, 1908.*

CHAPTER 350, ACTS OF 1908.

AN ACT RELATIVE TO THE CARRYING OF CONCEALED WEAPONS.

Be it enacted, etc., as follows:

SECTION 1. Section two of chapter one hundred and seventy-two of the acts of the year nineteen hundred and six is hereby amended by striking out the word "ten", in the seventh line, and inserting in place thereof the word: — twenty-five, — so as to read as follows: — *Section 2.* Whoever, except as provided by the laws of this commonwealth, carries on his person a loaded pistol or revolver, without authority or permission as provided in section one of this act, or whoever carries any stiletto, dagger, dirk-knife, slung-shot or metallic knuckles, shall upon conviction be punished by a fine of not less than twenty-five nor more than one hundred dollars, or by imprisonment for a term not exceeding one year, or by both such fine and imprisonment.

SECTION 2. Whenever any person is convicted of carrying a pistol, revolver or other weapon or article contrary to the provisions of section two of said chapter one hundred and seventy-two, the weapon or article so carried by him shall be confiscated to the use of the commonwealth. [*Approved April 3, 1908.*

CHAPTER 583, ACTS OF 1908.

AN ACT RELATIVE TO THE DISPOSITION OF CONFISCATED WEAPONS.

Be it enacted, etc., as follows:

Section two of chapter three hundred and fifty of the acts of the year nineteen hundred and eight is hereby amended by adding at the end thereof the words: — Any pistol, revolver or other weapon or article so confiscated shall, by the authority of the written order of the court or trial justice, be forwarded by common carrier to the chief of the district police, who, upon receipt of the same, shall notify said court or justice thereof. Said officer may sell or destroy the same, and, in case of a sale, after paying the cost of forwarding

the article, he shall pay over the net proceeds to the treasurer and receiver general, — so as to read as follows: — *Section 2.* Whenever any person is convicted of carrying a pistol, revolver or other weapon or article contrary to the provisions of section two of said chapter one hundred and seventy-two, the weapon or article so carried by him shall be confiscated to the use of the commonwealth. Any pistol, revolver or other weapon or article so confiscated shall, by the authority of the written order of the court or trial justice, be forwarded by common carrier to the chief of the district police, who, upon receipt of the same, shall notify said court or justice thereof. Said officer may sell or destroy the same, and, in case of a sale, after paying the cost of forwarding the article, he shall pay over the net proceeds to the treasurer and receiver general. [*Approved June 4, 1908.*

CHAPTER 568, ACTS OF 1908.

AN ACT RELATIVE TO THE DUTIES OF THE DISTRICT POLICE.

Be it enacted, etc., as follows:

SECTION 1. One member of the detective department of the district police shall give his whole time to enforcing the provisions of law relating to the arrest and care of tramps, except that in case of emergency he may temporarily be assigned to other duties by the chief of the district police.

SECTION 2. All acts and parts of acts inconsistent herewith are hereby repealed.

SECTION 3. This act shall take effect upon its passage. [*Approved June 1, 1908.*

CHAPTER 375, ACTS OF 1908.

AN ACT RELATIVE TO THE AGE LIMIT FOR APPOINTMENT AS A MEMBER OF THE INSPECTION DEPARTMENT OF THE DISTRICT POLICE.

Be it enacted, etc., as follows:

SECTION 1. A person who is not above the age of fifty years, if otherwise qualified, shall be eligible for appointment as an inspector of factories and public buildings, as a member of the inspection department of the district police.

SECTION 2. This act shall take effect upon its passage. [*Approved April 8, 1908.*

CHAPTER 185, ACTS OF 1908.

AN ACT TO PROVIDE FOR THE APPOINTMENT OF AN ADDITIONAL MEMBER OF THE DETECTIVE DEPARTMENT OF THE DISTRICT POLICE.

Be it enacted, etc., as follows:

SECTION 1. The governor is hereby authorized and requested to appoint one additional member of the district police, who shall be

employed in the detective department. His term of office, salary, powers and duties, shall be the same as those provided by law for the district police. The said appointment may be made without giving to veterans the preference required by sections twenty-one and twenty-two of chapter nineteen of the Revised Laws.

SECTION 2. This act shall take effect upon its passage. [*Approved March 7, 1908.*

CHAPTER 479, ACTS OF 1908.

AN ACT TO PROVIDE FOR AN ADDITIONAL STENOGRAPHER IN THE DETECTIVE DEPARTMENT OF THE DISTRICT POLICE.

Be it enacted, etc., as follows:

SECTION 1. The chief of the district police may appoint an additional stenographer in the office of the deputy chief of the detective department of the district police, at a salary not exceeding eight hundred dollars per annum.

SECTION 2. This act shall take effect upon its passage. [*Approved May 1, 1908.*

CHAPTER 531, ACTS OF 1908.

AN ACT RELATIVE TO THE SALE OF PAINT, TURPENTINE AND LINSEED OIL.

Be it enacted, etc., as follows:

SECTION 1. It shall be unlawful to sell, or offer or expose for sale, or to dispose of, or to have in possession with intent to sell or dispose of, any paint, turpentine or linseed oil which is labelled or marked in such manner as to deceive, or as to tend to deceive, any person as to its nature or composition.

SECTION 2. The term paint as used in this act shall include white lead, oxide or zinc and red lead, dry or in any kind of oil, and any compound intended for the same use, colors ground in oil, paste or semi-paste paint, and liquid or mixed paint ready for use.

SECTION 3. The having in possession, by any person, firm or corporation dealing in said articles, of any article or substance herein designated and marked or labelled contrary to the provisions hereof shall be prima facie evidence that the same is kept by such person, firm or corporation in violation of the provisions hereof.

SECTION 4. Any violation of this act shall for each offence be punished by a fine of not less than twenty-five and not more than one hundred dollars, or by imprisonment for not more than sixty days.

SECTION 5. Upon the written complaint of any person aggrieved by the violation of any provision of this act the district police and their agents are hereby authorized to enter any place of business, store or building where the sale of paint, turpentine or linseed oil

is carried on, and to open and inspect any package, can, jar, tub, or other receptacle containing articles that might be sold or exposed for sale in violation of the provisions of this act, and may appoint and remove inspectors, analysts and chemists for the purpose of inspecting or analyzing the contents of any such package, can, jar, tub or other receptacle. Inspectors so appointed shall have the same powers and authority relative to the articles aforesaid as are given by sections forty-two and fifty-two of chapter fifty-six of the Revised Laws to the inspectors named therein.

Section 6. Whoever hinders, obstructs or in any way interferes with any inspector, analyst or other officer appointed or acting under the provisions of this act, while in the performance of his official duty, shall be punished by a fine of not more than fifty dollars for the first offence, and of not more than one hundred dollars for each subsequent offence.

Section 7. This act shall take effect on the first day of January in the year nineteen hundred and nine. [*Approved May 19, 1908.*

Chapter 563, Acts of 1908.

An Act relative to the operation and inspection of steam boilers.

Be it enacted, etc., as follows:

Section 1. Section one of chapter four hundred and sixty-five of the acts of the year nineteen hundred and seven is hereby amended by striking out the words "of construction", in the twenty-second line, so as to read as follows: — *Section 1.* All steam boilers and their appurtenances, except boilers of railroad locomotives, motor road vehicles, boilers in private residences, boilers in public buildings and in apartment houses used solely for heating, and carrying pressures not exceeding fifteen pounds per square inch, and having less than four square feet of grate surface, boilers of not more than three horse power, boilers used for horticultural and agricultural purposes exclusively, and boilers under the jurisdiction of the United States, shall be thoroughly inspected internally and externally at intervals of not over one year, and shall not be operated at pressures in excess of the safe working pressure stated in the certificate of inspection hereinafter mentioned, which pressure is to be ascertained by rules established by the board of boiler rules, to be appointed as hereinafter provided; and shall be equipped with such appliances to insure safety of operation as shall be prescribed by said board. All such boilers installed after January first, nineteen hundred and eight, shall be so inspected when installed. No certificate of inspection shall be granted on any boiler installed after May first, nineteen hundred and eight, which does not conform to the rules formulated by the board of boiler rules.

Section 2. Section eighteen of said chapter four hundred and sixty-five is hereby amended by striking out the words "of construction", in the eleventh line, so as to read as follows: — *Section 18.* No insurance company shall issue a policy of insurance on a steam boiler for a longer period than three years. If a boiler is insured which has not previously been inspected externally and internally and a certificate of inspection issued, the company so insuring shall forthwith notify the chief of the boiler inspection department of the district police to that effect, and shall inspect such boiler internally and externally within one month after the insurance is effected. No insurance shall be effected on any boiler installed after May first, nineteen hundred and eight, which does not conform to the rules formulated by the board of boiler rules. [*Approved June 1, 1908.*

Chapter 36, Resolves of 1908.

Resolve to provide for investigation work and apparatus, and for maintenance expenses in the boiler inspection department of the district police.

Resolved, That there may be expended from the treasury of the commonwealth by the chief of the district police, a sum not exceeding one thousand dollars for investigation work, for apparatus used in connection with the inspection of steam boilers, and for the installation and maintenance of apparatus used by the boiler inspection department in the examination of engineers and firemen. [*Approved March 14, 1908.*

Chapter 565, Acts of 1908.

An Act relative to the use of moving picture machines.

Be it enacted, etc., as follows:

Section 1. No person, firm, corporation or association of persons shall operate or cause to be operated, and no manager, owner or proprietor of a hall, theatre, or other place of amusement shall permit to be used or operated, in any hall, theatre, or other place of amusement, any machine or other device for the projection of pictures upon a screen or other substance for a period exceeding twenty minutes for each film, picture, or series of pictures. Every person, firm, corporation or association of persons operating or owning such machines shall, after each film, picture, or series of pictures, or at the expiration of said period of twenty minutes, furnish some other form of amusement or entertainment, for a period of not less than five minutes. But the provisions of this section shall apply only to moving picture machines, so-called, and shall not be construed to include machines or other devices for projecting pictures upon a screen or other substance, which pictures remain stationary thereon.

SECTION 2. Any person, firm, corporation or association of persons violating any provision of this act shall be subject to a fine of not less than fifty dollars or to imprisonment for not less than six months. [*Approved June 1, 1909.*

CHAPTER 566, ACTS OF 1908.

AN ACT RELATIVE TO THE USE OF THE CINEMATOGRAPH.

Be it enacted, etc., as follows:

SECTION 1. No cinematograph, or similar apparatus involving the use of a combustible film more than ten inches in length, shall be kept or exhibited on the premises of a public building, place of public assemblage, or place used for entertainment, whether such premises are licensed or not licensed for entertainments, unless the district police have inspected and approved such cinematograph or other similar apparatus, and have placed thereon a numbered metal tag, nor until such precautions against fire as the district police may specify have been taken by the owner, user or exhibitor of such cinematograph or other similar apparatus. In addition, in the city of Boston the location of the cinematograph or other similar apparatus and of any booth or structure surrounding said apparatus shall be approved by the building commissioner, who may order such additional precautions against fire as he may deem necessary.

SECTION 2. The district police are hereby empowered and directed to inspect any cinematograph or other similar apparatus involving the use of a combustible film more than ten inches in length which is used or kept on premises designated in section one, and to make such rules and regulations as they may deem necessary for the safe use of such apparatus.

SECTION 3. Any person keeping, using or exhibiting a cinematograph or other similar apparatus contrary to the provisions hereof, or in violation of any rule or regulation made by the district police, or, in the city of Boston, in violation of any regulation or requirement made by the commissioner of buildings, in accordance with the provisions hereof, shall be punished by a fine of not less than twenty-five nor more than five hundred dollars.

SECTION 4. No person shall exhibit or operate any cinematograph or similar apparatus involving the use of a combustible film more than ten inches in length until he has received a license so to do from an inspector of the district police. The fee for the license shall be three dollars. The license shall be for the term of one year from the date thereof, but may be renewed yearly without examination, upon the payment of a fee of one dollar. The license may be revoked at any time by any member of the district police, but the person whose license is so revoked may appeal to the chief of the district police, whose decision in the matter shall be final.

No such license shall be granted until the applicant has passed an examination, similar to that required of applicants for engineers' licenses, proving him to be thoroughly skilled in the working of the mechanical and electrical apparatus or devices used in the operation of a cinematograph or similar apparatus, as hereinbefore defined. No cinematograph or similar apparatus as aforesaid shall be operated by oxy-hydrogen gas, so-called, or by lime light.

SECTION 5. When a licensee under this act desires to have an assistant he shall register the name, age, address and personal description of such assistant, on a form prepared for the purpose by the chief of the district police, and thereupon the said chief may issue a permit allowing such person to be employed as an assistant to rewind or repair moving picture films or apparatus, and to assist the licensee in the booth or other place where the moving picture is operated, but such person shall not himself operate or handle any moving picture machine. No person under the age of eighteen years shall act as such assistant.

SECTION 6. All licenses heretofore issued for the operation of any cinematograph or similar moving picture machine hereinbefore defined shall expire sixty days after the passage of this act.

SECTION 7. All acts and parts of acts inconsistent herewith are hereby repealed. [*Approved June 1, 1908.*

RULES AND REGULATIONS GOVERNING MOVING-PICTURE MACHINES, ISSUED JULY 1, 1908.

In accordance with the Acts of the Legislature of 1908, chapters 565 and 566, the following rules are hereby promulgated: —

No moving-picture exhibition will be allowed in any room or building until a license from the Chief of the District Police, or a certificate from an inspector of factories and public buildings, has been obtained for said room or building; except that, in the city of Boston, the license, certificate or permit for the room or building and exhibition is to be issued by the person or persons duly authorized to issue said license, certificate or permit.

The machine must be placed in a booth or enclosure approved by an inspector of factories and public buildings, and in which the said inspector's certificate of inspection is posted in a conspicuous place. The booth or enclosure must be so located as not to obstruct any aisle or passageway, or to obstruct or render dangerous any exit from the exhibition room or building, or to be liable to interference by any person in the audience. Sufficient means must be provided to allow the operator safe and convenient entry to and exit from the booth or enclosure, and to enable him to quickly and safely use the fire-extinguishing apparatus, and to safely work from the outside of the booth or enclosure in case of fire or accident.

The machine and support upon which the machine rests, and the

rheostat and its support, must be securely fastened to the floor, and no part shall come in contact with wood or any inflammable or combustible material.

Any change in mechanism, or alteration of any moving-picture machine after it has been approved and tagged by an inspector of factories and public buildings, will be cause for removal of the tag and condemnation of the machine. The removal of the inspector's tag will be cause for condemnation of machine and prohibition of its use.

No inflammable or combustible curtain or enclosure will be allowed around the machine or rheostat.

Where wires for conveying electricity pass into or through, or rest on, any structure around the machine, ample insulation must be provided by the use of conduits, porcelain tubes or other insulating substance.

The wire attachments conveying electricity must be properly insulated, and must be inspected by the operator before every operation, and the maximum voltage must not exceed 110 volts used in operating the machine.

A switch for shutting off or controlling the electric current must be provided, and so placed as to be ready for instant use by the operator.

If means for controlling lights in the auditorium or building are provided in the booth or enclosure, additional means must be provided near the main entrance for such control.

Sufficient fuses to prevent the passage of too great an electric current must be provided and properly placed for wires conveying electricity.

The arc lamp must be covered with an iron box so arranged as to catch all sparks and hot pieces of carbon, and all other lights in the booth or enclosure must be covered by a wire guard.

The rheostat must be covered with perforated sheet iron or heavy wire netting of fine mesh, to prevent any metallic substance or film coming in contact with it when in operation, and must be securely fastened to the floor and properly insulated.

No water rheostat will be allowed in any booth or structure surrounding the machine, or in any part of the building in which the machine is located.

A fire extinguisher of the carbonic acid gas pattern, in good working order, must be provided and located inside the booth or enclosure, ready for instant use.

The films must be wound upon a metal reel incased in an iron box with a slot in the bottom only large enough to permit the film to pass through two sets of metal rollers, which must fit tightly to the film. The joints necessary in the construction of this box must be made tight without the use of solder.

The cover which admits of the placing or removing of the reel in said box must have hinges so arranged that it will at all times close tight, and be provided with a fastening to lock when closed. Under this box must be arranged a box of similar design and construction, containing a reel for the reception of the film from the box above, with a slot in top and with two sets of rollers as directly under the top box as possible: the film to be conducted from the upper magazine or box and thence into the lower magazine or box of the same construction placed as near below the focus as possible, with a metal tube or some other approved shield large enough to allow the film to pass through that tube or shield into the lower box or magazine without any friction.

The film reels must be operated by a crank firmly secured to the spindle or shaft on head of the machine, so there will be no possibility of its coming off.

A shutter must be placed in front of the condenser, so as to be instantly closed when necessary.

No electric motor will be allowed with which to operate the machine.

No films, pieces of films or loose combustible or inflammable material will be allowed to remain in the booth or enclosure, unless protected by metal covering, except the films while actually being rewound or repaired.

All films must be rewound or repaired in the booth or enclosure surrounding the machine, and must each be separately kept in a closed metal box made without solder.

All boxes or magazines containing films must be kept closed while operating the machine.

The door of the booth or enclosure containing the machine must be kept closed at all times when the machine is being operated, and sufficient ventilation must be provided to carry off any excessive heat generated.

No smoking, or permitting it to be done, or matches, will be allowed in the booth or enclosure surrounding the machine.

No person under the influence of intoxicating liquor will be allowed at any time within the booth or enclosure.

All moving-picture operators must have their license or permit with them at all times when operating a machine, or rewinding or repairing films, or when otherwise employed in the booth or enclosure.

Careless or unskillful operating of any moving-picture machine will not be permitted.

Within twenty-four hours after any fire or accident, the operator and manager of the exhibition must send a written notice of said fire or accident to the Chief of the District Police, State House,

Boston, also a notice to the inspector of factories and public buildings of the district.

No person will be permitted to operate any moving-picture machine who is not in possession of a permit or license issued by an inspector of the inspection department of the Massachusetts District Police.

All members of the inspection department of the Massachusetts District Police are directed to see that the above rules are enforced, and to prosecute all violations of the same; and any violation of any of the rules and regulations of this department or of the laws of this Commonwealth relating to moving-picture machines or operators will be sufficient cause for the immediate revocation of the license of the operator or the permit of his assistant.

All officers inspecting machines must file in this office a duplicate of permits to the operator, as well as the machine number, maker's name and tag number.

All rules pertaining to moving-picture machines heretofore promulgated are discontinued upon the issuance of the above rules.

Additional Rules and Regulations governing Moving-picture Machines, issued Sept. 1, 1908.

There will be allowed in connection with the exhibition of moving pictures the use of a moving-picture machine which has been duly approved and tagged by a member of this department, also a stereopticon; but the use of oxy-hydrogen gas, so called, or lime light, will not be allowed in connection with moving pictures. No acetylene gas will be allowed.

There will also be allowed moving pictures, illustrated songs, a talking machine, one bass drum, one snare or kettle drum, one bugle and one piano.

One person at a time in citizen's or evening dress may be allowed on the stage to give description of moving pictures or stereopticon pictures.

Theatrical or vaudeville performances, costumes or scenery will not be allowed, except in such places as are authorized by the Chief of the District Police, or have a certificate from an inspector of factories and public buildings authorizing the giving of theatrical or vaudeville performances.

General Specifications for the Construction of Booths or Enclosures for Moving-picture Machines, as required by the Inspection Department of the Massachusetts District Police.[1]

Size. — All booths to be at least 7 feet high, the floor space to vary according to the number of machines in booths, as follows: 1 picture machine, 6 feet by 8 feet; 1 picture machine and 1 stereopticon, 9 feet by 8 feet; 2 picture machines and 1 stereopticon, 12 feet by 8 feet.

Frame. — To be made of structural steel, as follows: 4 outside horizontal members at top and bottom; 4 corner uprights, and members supporting roof to be made of 1½ inch by 1½ inch by ¼ inch angle irons. (See mark *A,* Figures 1, 2, 3 and 4.)

Intermediate uprights to be spaced every 2 feet, and to be made of either 1½ inch by 1½ inch by ¼ inch angle iron or 2 inch by 2 inch by ¼ inch Tee irons. (See mark *B,* Figures 2 and 3.)

Tee irons to which roof is attached to be made of 1½ inch by 1½ inch by 3/16 inch Tee irons. (See mark *C,* Figures 1 and 4.)

All joints to be made with a 3/16-inch steel plate, to which each angle iron or Tee iron shall be riveted or bolted by the use of at least two ¼-inch bolts or rivets. (See Figure 5.)

All bolts or rivets in frame to have flat heads, said heads always to be placed on exterior side of booth; all angle or Tee irons being so countersunk as to accomplish this result. (See Figure 5.)

Frame to be built with a 6 foot by 2 foot doorway (Figure 2); frame of said doorway to be built of 1 inch by 1 inch by 3/16 inch angle irons, which are to be joined together by the use of a 3/16-inch steel plate similar to that shown in Figure 5.

Covering of Booth. — Sides and top of booth and door to be covered with asbestos boards of at least ¼ inch thickness, said boards to be so cut and arranged that vertical joints between boards shall always come over an angle or Tee iron, so that both boards may be securely fastened to the same. (See Figure 6.)

After booth is complete, all openings where combustible material is exposed must be plugged with asbestos cement or other equally satisfactory material. When joints of asbestos boards on outside of booth do not come over angles or Tee irons, the cracks between the boards shall be covered by a strip of asbestos board at least ⅛ inch thick and 2 inches wide, said strips to be securely fastened to both boards in such manner as to cover the exposed joints. The above-mentioned strips and all asbestos board shall be secured in

[1] These specifications are to be followed in the construction of every *moving-picture machine booth* unless omitted or changed in some part by the State inspector. Booths must be approved by the inspection department of the Massachusetts District Police.

the proper place by the means of proper bolts and nuts; said bolts and nuts to be spaced not more than 6 inches apart.

Flooring. — Floor shall be made of two parts, an upper and a lower floor. Lower floor shall be made of board ⅞-inch minimum thickness, supported on lower leg of horizontal angle irons. Resting on this floor shall be a floor made of asbestos board of ⅜-inch minimum thickness, or an equally good material. (See Figure 7.)

Windows. — There shall not be more than two windows per machine in the booth, — one for the operator and one for the machine. Window for machine shall not be more than 6 inches high and 12 inches long, and shall be located and cut after machine is set up. Operator's window shall not be more than 4 inches wide or more than 12 inches high.

All windows shall be provided with gravity doors, which, when closed, shall overlap the window opening at least 1 inch on all sides; said doors to be held open normally by use of a fine combustible cord in series with a fusible link, so arranged that the doors may easily be released by hand.

Main Door. — Outside of door to be provided with a substantial spring sufficient to keep door closed. Door to be provided with stop to prevent it from swinging into booth or injuring the hinges.

Shelves. — To be made up of slate slabs or board not less than ⅞ inch thick, not exceeding 4 feet in length or 12 inches in width. Said shelves, if of board, to be painted with at least three coats of asbestos paint and supported by means of angle irons, as shown in Figure 4. Upper shelf to be used for the rewinding and repairing of films; the lower shelf to be used for the storage of films. A separate metal case, made without solder, shall be provided for each film when the same is not in the magazine or in the process of rewinding, said films to be kept in these cases.

Ventilation. — Booths to be provided with an inlet in each of four sides, said inlets to be 15 inches long and 3 inches high, the lower side of the same not to be more than 3 inches above floor level. Said inlets to be covered on the inside by a wire net of not greater than ⅛-inch mesh, netting to be firmly secured to the asbestos board by means of iron strips and screws. (See Figure 3.)

Near the center of the top of the booth shall be a circular opening of not less than 10 inches in diameter, the upper side of said opening to be provided with an iron flange, which flange is to be securely fastened to the Tee irons supporting the roof, as shown in Figure 1. Securely fastened to this flange shall be a vent pipe of not less than 10 inches diameter, said pipe leading to the outside of the building or to a special incombustible vent flue. In this vent pipe shall be placed a box containing a 12-inch electric fan (see Figure 2), said box to be provided with a door of sufficient size to permit of the examination or removal of this fan, this door to be made

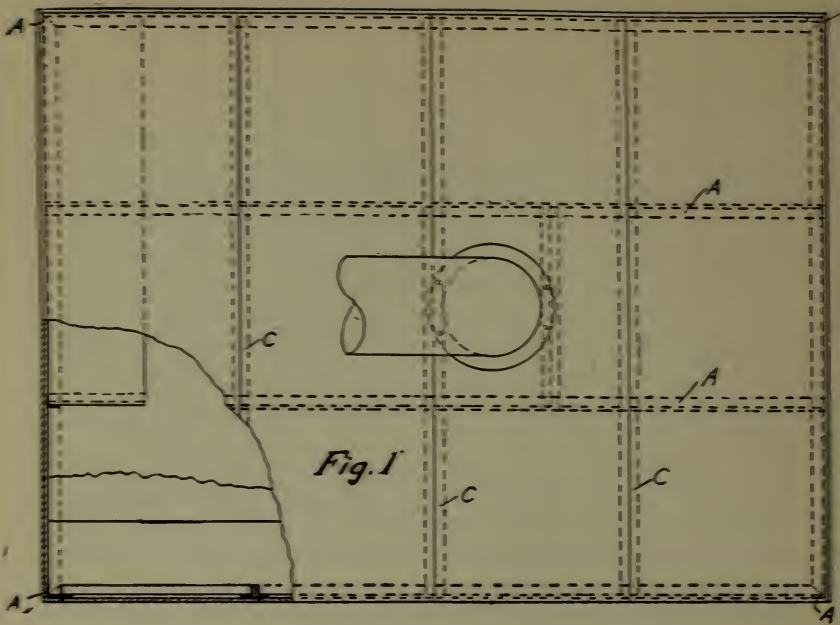
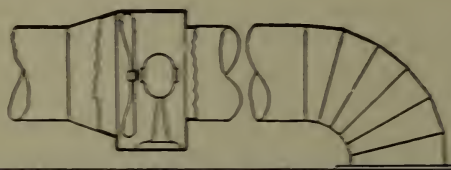


Fig. 1



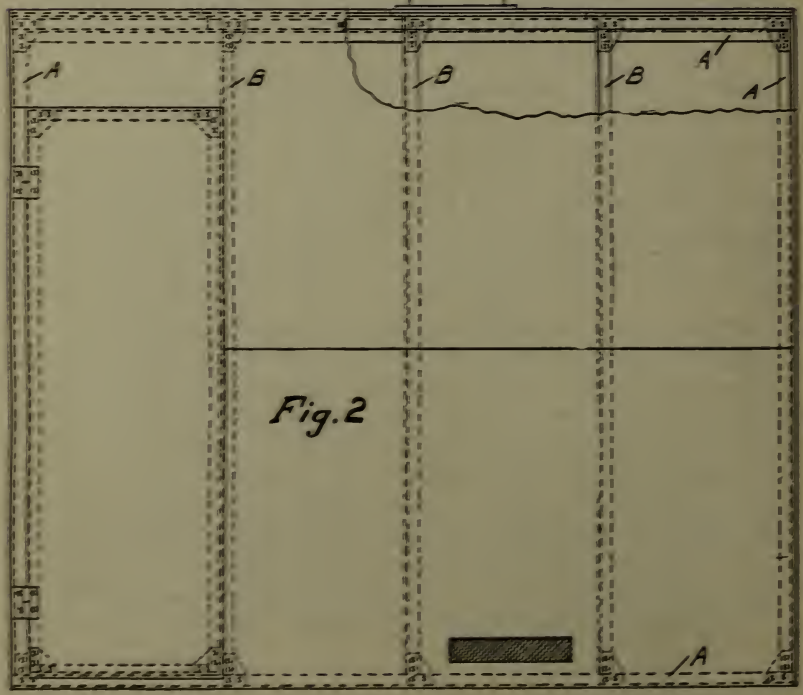


Fig. 2

Fig. 3

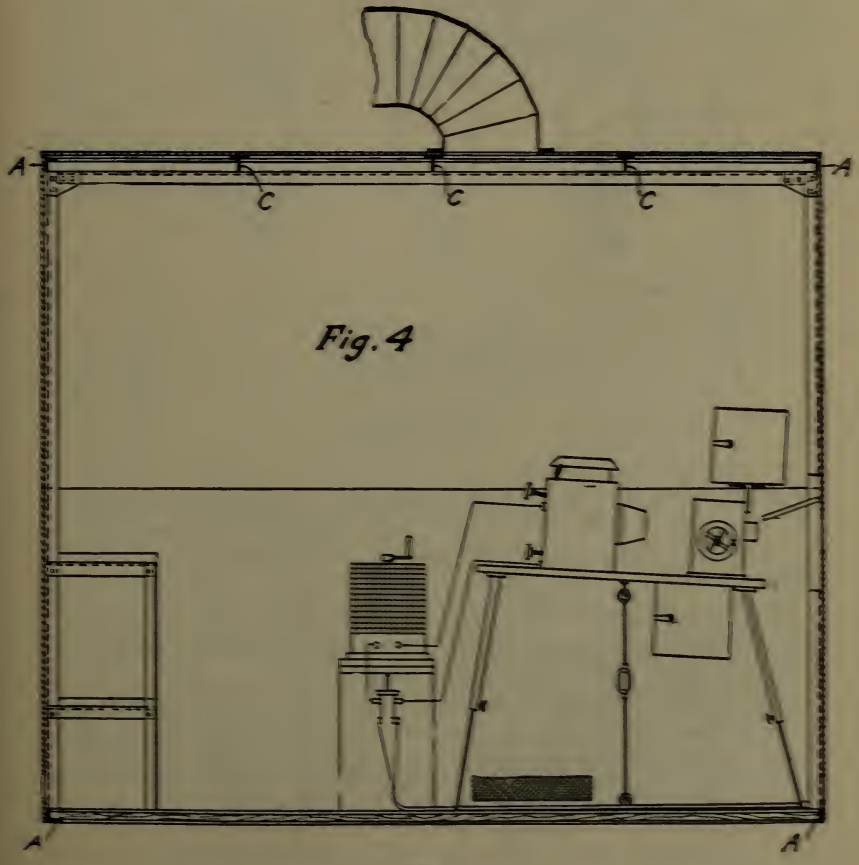
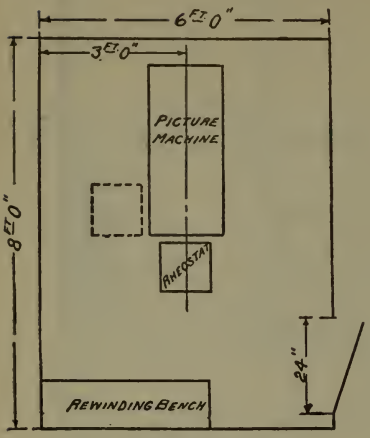
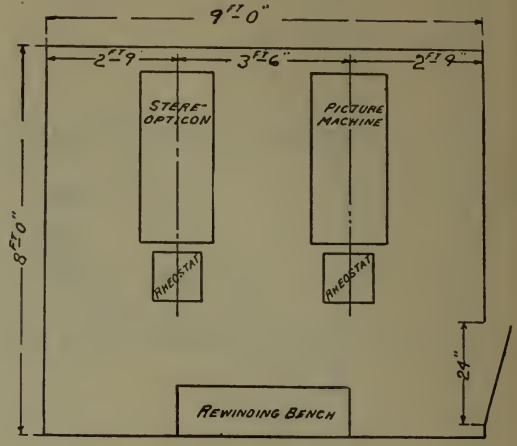


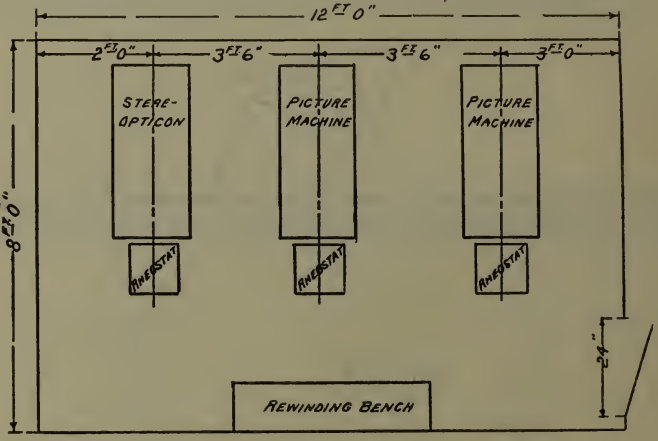
Fig. 4



PLAN No. 1



PLAN No. 2



PLAN No. 3

tight and provided with proper fastenings. Box and vent pipes to be made of galvanized iron or other non-combustible material. Fan to be so connected that it can be controlled from within the booth.

Wiring. — If house lights are controlled from within the booth, an additional emergency control must be provided near the main exit, and kept at all times in good condition.

All electric wires to be brought into the booth and carried to all machines, lights, etc., in conduits, as shown in Figure 4. One light will be allowed for each machine and one for the rewinding bench, but all such lights shall be provided with wire guards.

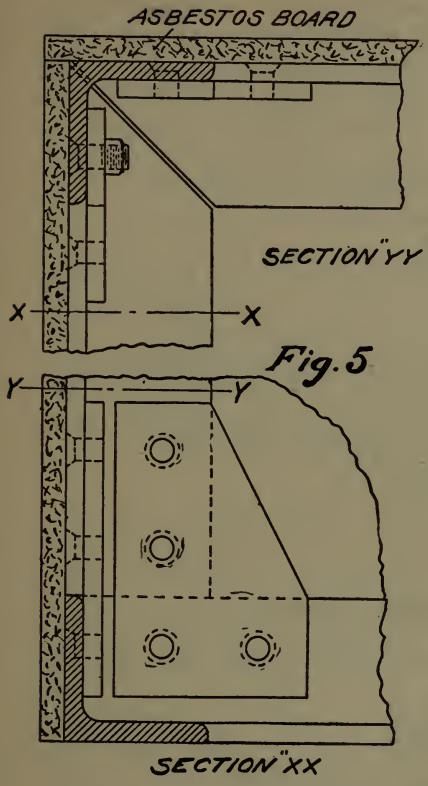


Fig. 5

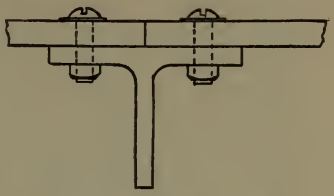


Fig. 6

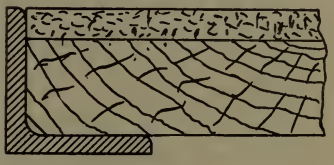


Fig. 7

Rheostats. — All rheostats to be mounted on slate insulator properly supported, said supports to be made of iron and securely fastened to the floor. Rheostats to be securely fastened to slate insulator.

Machines. — Must be securely fastened to the floor, to prevent accidental overturning or moving of same. (See Figure 4.)

Machine Location. — Machines to be located approximately as given in the attached plans, viz.: small booth, Plan No. 1; medium booth, Plan No. 2; largest booth, Plan No. 3.

The picture machines must always be so located that the driving belt will be at least 2 feet from the nearest parallel wall.

When the top magazine overhangs the front of the machine to such an extent that the passageway between rheostats and rewinding bench becomes too narrow, the rheostats may be set to one side of the machine, as indicated by dotted lines in Plan 1, but rheostats shall always be mounted directly in the rear of the machine, when practicable. The location of the booth shall be subject to the approval of the State inspector of factories and public buildings.

Permission to use portable booths which have been approved by this department does not extend to their use in any theatre or public hall in a city or town in which permanent booths have been installed. Permission to use portable booths is only intended to cover the temporary exhibition, for one night, of moving pictures in places of assemblage such as schools, churches, association halls, lodge rooms, etc., where, in the judgment of this department, it is not practicable to install permanent booths made in accordance with our specifications (Form No. 75).

All permissions for the use of portable booths are subject to the directions of the State inspector of factories and public buildings in whose district it is desired to use a portable booth.

Notice should be sent to this office at least one week before the date on which it is desired to use a portable booth, to enable the inspector to properly investigate the conditions under which the booth is to be used. The notice must also state the portion of the building in which the booth is to be located.

REPORTS OF BUILDING INSPECTORS.

Report of Inspector Ansel J. Cheney.

District No. 1.

Buildings or establishments visited,	470
Inspections made,	277
Orders issued (written, 72; verbal, 174),	246
Orders complied with (written, 72; verbal, 172),	244
Orders in process of compliance (written),	1
Building plans received,	88
Changes in plans ordered or recommended,	70
Certificates issued for buildings,	46
Prosecutions made,	1

Report of Inspector Richard S. Beyer.

District No. 1.

Buildings or establishments visited,	434
Inspections made,	129
Elevators inspected,	3
Orders issued (written, 21; verbal, 43),	64
Orders complied with (written, 14; verbal, 39),	53
Orders in process of compliance (written, 7; verbal, 4),	11
Cases and complaints investigated, including accidents,	7
Building plans received,	6
Changes in plans ordered or recommended,	4

Certificates issued for buildings,	10
Moving-picture machine booths inspected,	28
Moving-picture machine booths approved,	7
Moving-picture machines inspected,	5
Moving-picture machines tagged,	5

Report of Inspector John J. Sheehan.[1]

District No. 1.

Buildings or establishments visited,	770
Inspections made,	465
Orders issued,	286
Orders complied with,	151
Cases and complaints investigated, including accidents,	55

Report of Inspector Charles E. Burfitt.

District No. 2.

Buildings or establishments visited,	245
Inspections made,	652
Orders issued (written, 244; verbal, 121),	365
Orders complied with (written, 231; verbal, 121),	352
Orders in process of compliance (written),	13
Cases and complaints investigated, including accidents,	8
Building plans received,	43
Changes in plans ordered or recommended,	30
Certificates issued for buildings,	6
Moving-picture machine booths inspected,	12
Moving-picture machine booths approved,	12

Report of Inspector Horace F. Ball.

District No. 2.

Buildings or establishments visited,	417
Inspections made,	344
Orders issued (written, 79; verbal, 67),	146
Orders complied with (written, 76; verbal, 55),	131
Orders in process of compliance (written, 3; verbal, 12),	15
Cases and complaints investigated,	15
Building plans received,	41
Changes in plans ordered or recommended,	10
Certificates issued for buildings,	130
Moving-picture machines inspected,	10
Moving-picture machines tagged,	10
Moving-picture machine operators examined,	10
Moving-picture machine operators licensed,	10

[1] Died May 18, 1908.

Report of Inspector Henry J. Bardwell.

Districts Nos. 3 and 6.

Buildings or establishments visited,	455
Inspections made,	321
Orders issued (written, 200; verbal, 518),	718
Orders complied with (written, 183; verbal, 504),	687
Orders in process of compliance (written, 17; verbal, 14),	31
Cases and complaints investigated,	8
Building plans received,	59
Changes in plans ordered or recommended,	37
Certificates issued for buildings,	14
Moving-picture machine booths inspected,	24
Moving-picture machine booths approved,	24
Prosecutions made,	3

Report of Inspector Henry Splaine.

District No. 3.

Buildings or establishments visited,	82
Inspections made,	298
Elevators inspected,	11
Orders issued (written, 313; verbal, 28),	341
Orders complied with (written, 275; verbal, 28),	303
Orders in process of compliance (written),	38
Cases and complaints investigated, including accidents,	27
Building plans received,	13
Changes in plans ordered or recommended,	13
Certificates issued for buildings,	35
Moving picture machine booths inspected,	13
Moving-picture machine booths approved,	13

Report of Frederick W. Merriam.

Districts Nos. 3, 4 and 9.

Buildings or establishments visited,	607
Inspections made,	185
Orders issued (written, 14; verbal, 254),	268
Orders complied with (written, 23; verbal, 263),	[1]286
Orders in process of compliance (written),	5
Cases and complaints investigated, including accidents,	13
Building plans received,	27
Changes in plans ordered or recommended,	17
Certificates issued for buildings,	25
Moving-picture machines inspected,	1
Moving-picture machines tagged,	1

[1] Twenty-three of these were from previous year.

Report of Inspector Edwin Y. Brown.

District No. 4.

Buildings or establishments visited,	772
Inspections made,	344
Orders issued (written, 22; verbal, 250),	272
Orders complied with[1] (written, 19; verbal, 184),	203
Orders in process of compliance (written),	2
Cases and complaints investigated, including accidents,	3
Building plans received,	28
Changes in plans ordered or recommended,	6
Certificates issued for buildings,	220

Report of Inspector Walter A. Penniman.

District No. 5.

Buildings or establishments visited,	143
Inspections made,	228
Orders issued (written, 13; verbal, 14),	27
Orders complied with (written, 10; verbal, 13),	23
Orders in process of compliance (written, 3; verbal, 1),	4
Cases and complaints investigated, including accidents,	4
Building plans received,	9
Changes in plans ordered or recommended,	1
Moving-picture machine booths inspected,	6
Moving-picture machine booths approved,	6

Report of Inspector Charles Adams.

District No. 5.

Buildings or establishments visited,	579
Inspections made,	245
Orders issued (written),	390
Orders complied with (written),	219
Orders in process of compliance (written),	171
Cases and complaints investigated, including accidents,	12
Building plans received,	18
Changes in plans ordered or recommended,	10
Certificates issued for buildings,	58
Moving-picture machine booths inspected,	5
Moving-picture machine booths approved,	5
Moving-picture machine operators examined,	10
Moving-picture machine operators licensed,	10
Prosecutions made,	2
Amount of fines and costs paid,	$35

[1] The verbal orders given as not complied with were to summer hotels, which were closed before I could ascertain if the orders were complied with. Doubtless they will be when the hotels open another season.

Report of Inspector Joseph M. Dyson.[1]

District No. 5.

Buildings or establishments visited,	387
Inspections made,	245
Elevators inspected,	2
Orders issued,	80
Orders complied with,	15
Orders in process of compliance,	65
Cases and complaints investigated, including accidents,	12
Building plans received,	17
Changes in plans ordered or recommended,	13

Report of Inspector David H. Dyer.

District No. 6.

Buildings or establishments visited,	275
Inspections made,	56
Orders issued (written, 194; verbal, 18),	212
Orders complied with (written, 92; verbal, 18),	110
Orders in process of compliance (written),	102
Cases and complaints investigated, including accidents,	7
Building plans received,	16
Changes in plans ordered or recommended,	14

Report of Inspector Lemuel Pope.

Districts Nos. 6 and 8.

Buildings or establishments visited,	837
Inspections made,	223
Males employed, 2,214; females, 1,588,	3,802
Males between fourteen and sixteen employed, 112; females, 123,	235
Orders issued (written, 134; verbal, 105),	239
Orders complied with (written, 106; verbal, 86),	192
Orders in process of compliance (written, 28; verbal, 19),	47
Cases and complaints investigated, including accidents,	44
Building plans received,	38
Changes in plans ordered or recommended,	22
Certificates issued for buildings,	60
Moving-picture machine booths inspected,	19
Moving-picture machine booths approved,	17
Moving-picture machines inspected,	11
Moving-picture machines tagged,	11
Moving-picture machine operators examined,	38
Moving-picture machine operators licensed,	37

[1] Retired June 30, 1908.

Report of Inspector Ernest E. Cleveland.

Districts Nos. 7 and 9.

Buildings or establishments visited,	792
Inspections made,	536
Males employed, 2,313; females, 2,049,	4,362
Males between fourteen and sixteen employed, 177; females, 198,	375
Orders issued (written, 87; verbal, 195),	282
Orders complied with (written, 67; verbal, 185),	252
Orders in process of compliance (written, 20; verbal, 10),	30
Cases and complaints investigated, including accidents,	19
Building plans received,	61
Changes in plans ordered or recommended,	12
Certificates issued for buildings,	8
Moving-picture machine booths inspected,	3
Moving-picture machines inspected,	4
Moving-picture machines tagged,	3
Moving-picture machine operators examined,	25
Moving-picture machine operators licensed,	18
Prosecutions made,	1

Report of Inspector Warren S. Buxton.[1]

District No. 7.

Buildings or establishments visited,	95
Inspections made,	43
Orders issued (written, 1),	1
Orders complied with,	1
Building plans received,	31
Changes in plans ordered or recommended,	2
Prosecutions made,	2

REPORTS OF FACTORY INSPECTORS.

Report of Inspector Malcolm Sillars.

District No. 1.

Buildings or establishments visited,	1,020
Inspections made,	709
Elevators inspected,	130
Males employed, 28,039; females, 13,724,	41,763
Males between fourteen and sixteen employed, 254; females, 230,	484

[1] Retired April 30, 1908.

Orders issued (written, 10; verbal, 283),	293
Orders complied with (written, 4; verbal, 95),	99
Orders in process of compliance (written, 6; verbal, 188),	194
Cases and complaints investigated, including accidents,	5
Moving-picture machine booths inspected,	26
Moving-picture machine booths approved,	26
Moving-picture machines inspected,	36
Moving-picture machines tagged,	24
Moving-picture operators examined,	55
Moving-picture operators licensed,	49
Prosecutions made,	2
Amount of fines and costs paid,	$5

REPORT OF INSPECTOR FRANK C. WASLEY.

Districts Nos. 1 and 2.

Buildings or establishments visited,	500
Inspections made,	500
Elevators inspected,	56
Males employed, 30,081; females, 24,405,	54,486
Males between fourteen and sixteen employed, 1,064; females, 1,260,	2,324
Orders issued (written, 187; verbal, 51),	238
Orders complied with (written, 178; verbal, 51),	229
Orders in process of compliance (written),	9
Cases and complaints investigated, including accidents,	38
Moving-picture machine booths inspected,	13
Moving-picture machine booths approved,	13
Moving-picture machines inspected,	35
Moving-picture machines tagged,	35
Moving-picture operators examined,	19
Moving-picture operators licensed,	10

REPORT OF INSPECTOR ARLON S. ATHERTON.

District No. 2.

Buildings or establishments visited,	1,244
Inspections made,	843
Elevators inspected,	256
Males employed, 39,940; females, 19,503,	59,443
Males between fourteen and sixteen employed, 435; females, 422,	857
Orders issued (written, 35; verbal, 278),	313
Orders complied with (written, 23; verbal, 214),	237
Orders in process of compliance (written, 12; verbal, 64),	76
Cases and complaints investigated, including accidents,	87
Moving-picture machine booths inspected,	20
Moving-picture machine booths approved,	20

Moving-picture machines inspected,	7
Moving-picture machines tagged,	6
Moving-picture operators examined,	139
Moving-picture operators licensed,	100

Report of Inspector James W. Hoitt.

Districts Nos. 2, 3 and 9.

Buildings or establishments visited,	107
Inspections made,	524
Elevators inspected,	8
Males employed, 10,256; females, 6,990,	17,246
Males between fourteen and sixteen employed, 229; females, 226,	455
Orders issued (verbal),	75
Orders complied with (verbal),	75
Cases and complaints investigated, including accidents,	7
Moving-picture machine booths inspected,	15
Moving-picture machine booths approved,	15
Moving-picture machines inspected,	30
Moving-picture machines tagged,	30
Moving-picture machine operators examined,	74
Moving-picture machine operators licensed,	58
Prosecutions made,	1
Amount of fines and costs paid,	$20

Report of Inspector Samuel L. Ryan.[1]

Districts Nos. 2, 3 and 9.

Buildings or establishments visited,	215
Inspections made,	116
Elevators inspected,	1
Orders issued (written, 14; verbal, 19),	33
Orders complied with (written, 14; verbal, 19),	33
Cases and complaints investigated, including accidents,	48
Moving-picture machines inspected,	20
Moving-picture machines tagged,	20
Moving-picture operators examined,	8
Moving-picture operators licensed,	8
Prosecutions made,	3

Report of Inspector William J. McKeever.

Districts Nos. 3 and 4.

Buildings or establishments visited,	221
Inspections made,	854
Elevators inspected,	139

[1] Died March 25, 1908.

Males employed, 34,421; females, 13,453.	47,874
Males between fourteen and sixteen employed, 496; females, 301.	797
Orders issued (written, 16; verbal, 227).	243
Orders complied with (written, 16; verbal, 224).	[1]240
Orders in process of compliance (written).	5
Cases and complaints investigated, including accidents.	24
Moving-picture machine booths inspected.	24
Moving-picture machine booths approved.	24
Moving-picture machines inspected.	10
Moving-picture machines tagged.	10
Moving-picture operators examined.	[2]78
Moving-picture operators licensed.	59

Report of Inspector John E. Griffin.

Districts Nos. 3 and 9.

Buildings or establishments visited.	865
Inspections made.	339
Males employed, 1,977; females, 1,657.	3,634
Males between fourteen and sixteen employed, 45; females, 37.	82
Orders issued (written, 16; verbal, 168).	184
Orders complied with (written, 3; verbal, 105).	108
Orders in process of compliance (written, 13; verbal, 63).	76
Cases and complaints investigated, including accidents.	95
Moving-picture machine booths inspected.	38
Moving-picture machine booths approved.	32
Moving-picture machines inspected.	80
Moving-picture machines tagged.	73
Moving-picture operators examined.	154
Moving-picture operators licensed.	70
Prosecutions made.	7
Amount of fines and costs paid.	$215

Report of Inspector Charles A. Dam.

District No. 5.

Buildings or establishments visited.	586
Inspections made.	553
Elevators inspected.	227
Males employed, 50,360; females, 23,009.	73,369
Males between fourteen and sixteen employed, 1,542; females, 1,183.	2,725

[1] Two of the verbal orders complied with were issued the previous year.

[2] Fifteen examinations were previous to examinations under the provisions of chapter 566, Acts of 1908.

Orders issued (written, 6; verbal, 153),	159
Orders complied with (written, 6; verbal, 150),	156
Orders in process of compliance (verbal),	3
Cases and complaints investigated, including accidents,	28
Prosecutions made,	3
Amount of fines and costs paid,	$35

Report of Inspector Robert Ellis.

District No. 6.

Buildings or establishments visited,	523
Inspections made,	327
Elevators inspected,	48
Males employed, 38,315; females, 30,079,	68,394
Males between fourteen and sixteen employed, 1,616; females, 1,661,	3,277
Orders issued (written),	[1]122
Orders complied with (written),	115
Orders in process of compliance (written),	7
Cases and complaints investigated, including accidents,	71
Moving-picture machine booths inspected,	26
Moving-picture machine booths approved,	25
Moving-picture machines inspected,	23
Moving-picture machines tagged,	18
Moving-picture operators examined,	35
Moving-picture operators licensed,	26

Report of Inspector James R. Howes.

District No. 7.

Buildings or establishments visited,	699
Inspections made,	341
Elevators inspected,	163
Males employed, 11,192; females, 7,700,	18,892
Males between fourteen and sixteen employed, 440; females, 407,	847
Orders issued (written, 15; verbal, 330),	345
Orders complied with (written, 6; verbal, 319),	325
Orders in process of compliance (written, 9; verbal, 11),	20
Cases and complaints investigated, including accidents,	129
Building plans received,	11
Changes in plans ordered or recommended,	5
Certificates issued for buildings,	130
Moving-picture machine booths inspected,	14
Moving-picture machine booths approved,	10
Moving-picture machines inspected,	40

[1] Including 4 from previous year.

Moving-picture machines tagged,	30
Moving-picture operators examined,	75
Moving-picture operators licensed,	58
Prosecutions made,	1
Amount of fines and costs paid,	$25

Report of Inspector Harry Atkinson.

District No. 9.

Buildings or establishments visited,	251
Inspections made,	279
Elevators inspected,	3
Males employed, 7,442; females, 3,251,	10,693
Males between fourteen and sixteen employed, 135; females, 194,	329
Orders issued (written, 12; verbal, 153),	165
Orders complied with (written, 9; verbal, 144),	153
Orders in process of compliance (written, 3; verbal, 9),	12
Cases and complaints investigated, including accidents,	18
Building plans received,	1
Moving-picture machine booths inspected,	4
Moving-picture machine booths approved,	4
Moving-picture machines inspected,	1
Moving-picture machines tagged,	1
Moving-picture operators examined,	26
Moving-picture operators licensed,	14

Report of Inspector Charles S. Clerke.

District No. 9.

Buildings or establishments visited,	381
Inspections made,	1,243
Males employed, 14,066; females, 5,938,	20,004
Males between fourteen and sixteen employed, 92; females, 252,	344
Orders issued (written, 13; verbal, 431),	444
Orders complied with (written, 12; verbal, 420),	432
Orders in process of compliance (written, 1; verbal, 11),	12
Cases and complaints investigated, including accidents,	139
Moving-picture machine booths inspected,	8
Moving-picture machine booths approved,	6
Moving-picture machines inspected,	16
Moving-picture machines tagged,	12
Moving-picture operators examined,	168
Moving-picture operators licensed,	74

Report of Inspector John H. Plunkett.

District No. 9.

Buildings or establishments visited,	1,044
Inspections made,	852
Elevators inspected,	46
Males employed, 12,187; females, 5,542,	17,729
Males between fourteen and sixteen employed, 195; females, 300,	495
Orders issued (written, 1; verbal, 392),	393
Orders complied with (written, 1; verbal, 339),	340
Orders in process of compliance (verbal),	53
Cases and complaints investigated, including accidents,	48
Moving-picture machine booths inspected,	17
Moving-picture machine booths approved,	7
Moving-picture machines inspected,	15
Moving-picture machines tagged,	13
Moving-picture operators examined,	122
Moving-picture operators licensed,	70

Report of Inspector Mary E. Halley.

District No. 6.

Buildings or establishments visited,	469
Inspections made,	213
Males employed, 12,171; females, 10,991,	23,162
Males between fourteen and sixteen employed, 325; females, 481,	806
Orders issued (written, 165; verbal, 15),	180
Orders complied with (written, 165; verbal, 15),	180
Cases and complaints investigated, including accidents,	21
Prosecutions made,	3
Amount of fines and costs paid,	$20

Report of Inspector Mary A. Nason.

District No. 9.

Buildings or establishments visited,	55
Inspections made,	1,152
Males employed, 9,040; females, 15,092,	24,132
Males between fourteen and sixteen employed, 413; females, 575,	988
Orders issued (written, 39; verbal, 180),	219
Orders complied with (written, 39; verbal, 180),	219
Cases and complaints investigated,	25
Prosecutions made,	2
Amount of fines and costs paid,	$45

GENERAL SUMMARY OF FACTORY

	Inspectors.	Buildings or Establishments visited.	Number of Inspections made.	Elevators inspected.	Number of Males employed.	Number of Females employed.	Total Males and Females.	Males between 14 and 16.	Females between 14 and 16.	Total Males and Females between 14 and 16.	Written Orders issued.
	Building Inspectors.										
1	Adams, Charles,	579	245	–	–	–	–	–	–	–	[illegible]
2	Ball, Horace F.,	417	344	–	–	–	–	–	–	–	[illegible]
3	Bardwell, Henry J.,	455	321	–	–	–	–	–	–	–	[illegible]
4	Beyer, Richard S.,	434	129	3	–	–	–	–	–	–	[illegible]
5	Brown, Edwin Y.,	772	344	–	–	–	–	–	–	–	[illegible]
6	Burfitt, Charles E.,	245	652	–	–	–	–	–	–	–	[illegible]
7	Buxton, Warren S.,	95	43	–	–	–	–	–	–	–	[illegible]
8	Cheney, Ansel J.,	470	277	–	–	–	–	–	–	–	[illegible]
9	Cleveland, Ernest E.,	792	536	–	2,313	2,049	4,362	177	198	375	[illegible]
10	Dyer, David H.,	275	56	–	–	–	–	–	–	–	[illegible]
11	Dyson, Joseph M.,	387	245	2	–	–	–	–	–	–	[illegible]
12	Merriam, Frederick W.,	607	185	–	–	–	–	–	–	–	[illegible]
13	Penniman, Walter A.,	143	228	–	–	–	–	–	–	–	[illegible]
14	Pope, Lemuel,	837	223	–	2,214	1,588	3,802	112	123	235	[illegible]
15	Sheehan, John J.,	770	465	–	–	–	–	–	–	–	[illegible]
16	Splaine, Henry,	82	298	11	–	–	–	–	–	–	[illegible]
	Factory Inspectors.										
17	Atherton, Arlon S.,	1,244	843	256	39,940	19,503	59,443	435	422	857	[illegible]
18	Atkinson, Harry,	251	279	3	7,442	3,251	10,693	135	194	329	[illegible]
19	Clerke, Charles S.,	381	1,243	–	14,066	5,938	20,004	92	252	344	[illegible]
20	Dam, Charles A.,	586	553	227	50,360	23,009	73,369	1,542	1,183	2,725	[illegible]
21	Ellis, Robert,	523	327	48	38,315	30,079	68,394	1,616	1,661	3,277	[illegible]
22	Griffin, John E.,	865	339	–	1,977	1,657	3,634	45	37	82	[illegible]
23	Hoitt, James W.,	107	524	8	10,256	6,990	17,246	229	226	455	–
24	Howes, James R.,	699	341	163	11,192	7,700	18,892	440	407	847	[illegible]
25	McKeever, William J.,	221	854	139	34,421	13,453	47,874	496	301	797	[illegible]
26	Plunkett, John H.,	1,044	852	46	12,187	5,542	17,729	195	300	495	1
27	Ryan, Samuel L.,	215	116	1	–	–	–	–	–	–	14
28	Sillars, Malcolm,	1,020	709	130	28,039	13,724	41,763	254	230	484	[illegible]
29	Wasley, Frank C.,	500	500	56	30,081	24,405	54,486	1,064	1,260	2,324	[illegible]
30	Halley, Mary E.,	469	213	–	12,171	10,991	23,162	325	481	806	[illegible]
31	Nason, Mary A.,	55	1,152	–	9,040	15,092	24,132	413	575	988	[illegible]
	Totals,	15,540	13,436	1,093	304,014	184,971	488,985	7,570	7,850	15,420	[illegible]

AND BUILDING INSPECTIONS.

Verbal Orders Issued.	Compliances, Written.	Compliances, Verbal.	Process of Compliance, Written.	Process of Compliance, Verbal.	Cases and Complaints Investigated.	Building Plans received.	Changes ordered or recommended.	Certificates issued for Buildings.	Moving picture Machine Booths inspected.	Moving picture Machine Booths approved.	Moving picture Machines inspected.	Moving picture Machines licensed.	Moving picture Machine Operators examined.	Moving picture Machine Operators licensed.	Number of Prosecutions.	Amount of Fines.	
-	210	-	171	-	12	18	10	58	5	5	-	-	10	10	2	$35 00	1
67	76	55	3	12	15	41	10	130	-	-	10	10	10	10	-	-	2
518	183	504	17	14	8	59	37	14	24	24	-	-	-	-	3	-	3
43	14	39	7	4	7	6	4	10	28	7	5	5	-	-	-	-	4
250	19	184	3	-	3	28	6	220	-	-	-	-	-	-	-	-	5
121	231	121	13	-	8	43	30	6	12	12	-	-	-	-	-	-	6
-	1	-	-	-	-	31	2	-	-	-	-	-	-	-	2	-	7
174	72	174	1	-	-	88	70	46	-	-	-	-	-	-	1	-	8
195	67	185	20	10	19	61	12	8	3	-	4	3	25	18	1	-	9
18	92	18	102	-	7	16	14	-	-	-	-	-	-	-	-	-	10
-	15	-	65	-	12	17	13	-	-	-	-	-	-	-	-	-	11
254	23	263	5	-	13	27	17	25	-	-	1	1	-	-	-	-	12
14	10	13	3	1	4	9	1	-	6	6	-	-	-	-	-	-	13
105	106	86	28	19	44	38	22	60	19	17	11	11	38	37	-	-	14
-	151	-	135	-	55	-	-	-	-	-	-	-	-	-	-	-	15
28	275	28	38	-	27	13	13	35	13	13	-	-	-	-	-	-	16
278	23	214	12	64	87	-	-	-	20	20	7	6	129	100	-	-	17
153	9	144	3	9	18	1	-	-	4	4	1	1	26	14	-	-	18
431	12	420	1	11	139	-	-	-	8	6	16	12	168	74	-	-	19
153	6	150	-	3	28	-	-	-	-	-	-	-	-	-	3	35 00	20
-	115	-	7	-	71	-	-	-	26	25	23	18	35	26	-	-	21
168	3	105	13	63	95	-	-	-	38	32	80	73	154	70	7	215 00	22
75	-	75	-	-	7	-	-	-	15	15	30	30	74	58	1	20 00	23
330	6	319	9	11	129	11	5	130	14	10	40	30	75	58	1	25 00	24
227	16	224	-	5	24	-	-	-	24	24	10	10	78	59	-	-	25
392	1	339	-	53	48	-	-	-	17	7	15	13	122	70	-	-	26
19	14	19	-	-	48	-	-	-	-	-	20	20	8	8	3	-	27
283	4	95	6	188	5	-	-	-	26	26	36	24	55	49	2	5 00	28
51	178	51	9	-	38	-	-	-	13	13	35	35	19	10	-	-	29
15	165	15	-	-	21	-	-	-	-	-	-	-	-	-	3	20 00	30
180	39	180	-	-	25	-	-	-	-	-	-	-	-	-	2	45 00	31
4,542	2,135	4,020	671	467	1,017	507	266	742	315	266	344	302	1,036	671	31	$400 00	

RECAPITULATION OF FACTORY AND BUILDING INSPECTIONS.

Buildings or establishments visited,	15,540
Inspections made,	13,436
Elevators inspected,	1,093
Males employed,	304,014
Females employed,	184,971
Total males and females employed,	488,985
Males between fourteen and sixteen employed,	7,570
Females between fourteen and sixteen employed,	7,850
Total number between fourteen and sixteen employed,	15,420
Orders issued (written, 2,802; verbal, 4,542),	7,344
Orders complied with (written, 2,135; verbal, 4,020),	6,155
Orders in process of compliance (written, 671; verbal, 467),	1,138
Cases and complaints investigated,	1,017
Building plans received,	507
Changes in plans ordered or recommended,	266
Certificates issued for buildings,	742
Moving-picture machine booths inspected,	315
Moving-picture machine booths approved,	266
Moving-picture machines inspected,	344
Moving-picture machines licensed,	302
Moving-picture machine operators examined,	1,036
Moving-picture machine operators licensed,	671
Prosecutions made,	31
Amount of fines paid,	$400

OVERTIME.

Overtime employment in manufacturing establishments for the year ending Oct. 31, 1908, was as follows: —

Time reported as lost,	76 hrs., 40 min.
Time reported as made up,	62 hrs., 35 min.

This report includes all time reported as lost by the stopping of machinery, whether part of the factory was shut down, or the entire factory.

BOILER INSPECTION DEPARTMENT.

The districts, as shown on pages 18–22 of this report, are the same as last year, with the exception that the Hampshire County section of District No. 7 has now a branch office at Northampton, instead of at Springfield, as formerly. With this addition, there are now inspectors of boilers assigned to 7 branch offices, namely, 2 at Fall River, 1 at Lowell, 1 at North Adams, 1 at Northampton, 2 at Salem, 2 at Springfield and 2 at Worcester. The examination of engineers and firemen, however, is not carried on at the branch offices at Lowell or Northampton, as no appropriation was available to install the necessary apparatus at these two points. The examinations for the Northampton district are still conducted at Springfield, and those for the Lowell district at headquarters, Room 3, State House, Boston.

The Legislature of 1908 appropriated $1,000 "for investigation work, for apparatus used in connection with the inspection of steam boilers, and for the installation and maintenance of apparatus used by the boiler inspection department in the examination of engineers and firemen." Of this amount, $750 were expended in installing apparatus at the Salem branch office, to be used in connection with the examination of engineers and firemen; the balance of the appropriation was used for the maintenance of existing apparatus at the other offices, and for investigation work.

Efforts were made to procure for the Salem office a second-hand Corliss type engine of small size, similar to those which had been purchased for the offices at Boston, Springfield and Worcester; no such engine was procurable, however, and the appropriation was not sufficient to purchase a new engine.

The apparatus at the Salem branch office includes a horizontal return tubular boiler, built to the Massachusetts standard, slide valve engine, duplex pump, inspirators, feed water heater, damper regulator and all necessary piping and attachments; all details of piping and appendages conforming with the rules formulated by the Board of Boiler Rules. This installation results in a great saving of time and expense

to applicants for license from Essex County, excepting Andover, Lawrence and Methuen, as, formerly, all Essex County applicants were required to come to the State House for examination. It also means a great saving of time and travel for the inspectors assigned to the Salem office, and this will also relieve the examination room at the State House of some 500 examinations per year.

After consultation with the Attorney-General of the Commonwealth, a bill was submitted to the Legislature to amend sections 1 and 18 of the boiler inspection law, chapter 465 of the Acts of 1907, by striking out the words "of construction," in the last sentence of section 1, after the word "rules," so as to read as follows: "No certificate of inspection shall be granted on any boiler installed after May first, nineteen hundred and eight, which does not conform to the rules formulated by the board of boiler rules." Also by striking out the words "of construction," in the last sentence of section 18, after the word "rules," so as to read: "No insurance shall be effected on any boiler installed after May first, nineteen hundred and eight, which does not conform to the rules formulated by the board of boiler rules;" this being necessary to permit the relocation of boilers installed before May 1, 1908. This bill, chapter 563, Acts of 1908, became law June 1, 1908.

A rule was then formulated by the Board of Boiler Rules, allowing the relocation of boilers that do not conform to the Massachusetts standard in every detail, but the longitudinal joints of which, however, are strictly in accordance with paragraphs 7, 8 and 9 of section 4, part III. of the rules; therefore, no boiler the shell or drum of which exceeds 36 inches in diameter, and whose longitudinal joints are of lap-riveted construction, has been installed or relocated in this Commonwealth since May 1, 1908. This rule also allowed the installation of boilers which had not previously been installed, and had been designed by the manufacturers to the Massachusetts standard, but did not conform in every detail with the rules, and therefore could not otherwise have been installed. A large amount of work was done in connection with the 94 joint inspections made under this rule,

as in almost all cases two inspectors of this department, acting jointly, made the inspections.

There has been no change in chapter 102 of the Revised Laws, relating to the licensing of engineers and firemen, during the past year.

Several thousand record books, as required by section 85 of the engineers' and firemen's license law, have been distributed by the members of this department during the past year, and are now being used daily by the engineers in charge of stationary boilers operated at over 25 pounds pressure per square inch. One of the duties of the members of this department is, when visiting steam plants, to see that the proper entries are made in the record books. When necessary, the engineer is shown the proper method of keeping the record book, but in general the engineers have readily understood what was required. The record book has been received with general satisfaction both by employers and engineers; and it is certainly of great assistance to this department in the enforcement of the engineers' license law and also the boiler inspection law, besides being a protection to the employer, the conscientious engineer and all persons affected by the operation of steam boilers.

On Monday, Dec. 9, 1907, at 8.45 P.M., a steam boiler exploded at the Hygienic Blanket Company's plant, Hubbardston, Mass., killing the night watchman, Alexander Greco, instantly, and demolishing the boiler house and the greater part of the factory. The only other person in the building at the time was a tramp who had been given shelter for the night, and who escaped without injury.

The boiler was built in June, 1895, for Mr. C. G. Wood, and was installed in his woolen mill at Quinepoxet, Mass., where it was used until the spring of 1903, at which time it was taken out and replaced by a butt strap boiler. It was purchased and installed by the Hygienic Blanket Company in April, 1903.

The boiler was of the horizontal return tubular type, 17 feet long, 60 inches diameter, longitudinal seams, lap-triple-riveted; thickness of shell plates .329 inch; stamped "Paxton Rolling Mill, fire box steel 55,000 T. S., Harrisburg;"

diameter of rivet holes, .8125 inch; pitch of rivets, 3.5 inches. Each head above the tubes was supported by nine 2½-inch by ½-inch diagonal welded braces, with jaw ends.

This boiler was insured, and the date of the last inspection was Oct. 26, 1907, a pressure of 80 pounds per square inch being allowed, which pressure was within the allowable pressure by the rules.

On the afternoon preceding the explosion, the 3-inch Crosby Meady pop safety valve on this boiler blew freely at 80 pounds, by the gauge. The safety valve was found 234 feet from the original location of the boiler, having struck the end of a building in its flight, and, when tested under steam, released at 81½ pounds, as shown by a calibrated test gauge.

This explosion was caused by a lap crack on the rear course, at the longitudinal joint, which was a triple-riveted lap joint. The crack started on the inside of the outside lap, and, as the inside lap extended beyond the crack, it could not be detected by inspection.

Specimens cut from the ruptured sheet and tested at the Massachusetts Institute of Technology showed the following chemical and physical properties: phosphorus, .026 per cent.; sulphur, .015 per cent.; manganese, .30 per cent.

Specimen cut lengthwise of sheet: tensile strength, pounds per square inch, 62,360; yield point, pounds per square inch, 42,020; elongation, per cent. in 8 inches, 21.75.

Specimen cut crosswise of sheet: tensile strength, pounds per square inch, 59,980; yield point, pounds per square inch, 45,110; elongation, per cent. in 8 inches, 24.1.

A test piece was also cut from one of the diagonal braces of this boiler, and showed a tensile strength of 49,440 pounds; ultimate extension of 12.5 per cent. in 8 inches; reduction of area of cross-section, 1.04 per cent.; yield point, 34,850 pounds. The braces had no bearing whatever on the cause of the explosion, the test being of value only as showing the physical properties of the iron braces.

The result of these tests goes to show that the explosion was caused by the form of joint, viz., lap-riveted, rather than the quality of the material of which the boiler shell was constructed, the cause being identically the same as that which

exploded the boiler of the R. B. Grover Shoe Company, at Brockton, on March 20, 1905, and of the P. J. Harney Shoe Company, at Lynn, on Dec. 6, 1906; the only difference being that the lap joint in this case was triple-riveted, instead of double-riveted.

The further installation of boilers, the shells or drums of which are over 36 inches in diameter, constructed with longitudinal lap joints, is now prohibited by paragraph 7, section 4, part III., of the rules formulated by the Board of Boiler Rules, which took effect May 1, 1908.

Under the provisions of the previous boiler inspection law, which was in force up to Oct. 1, 1907, it was the duty of this department to enforce the recommendations of repairs or changes on steam boilers, made to the owners of the boilers by the insurance companies. This involved an enormous amount of correspondence with the owners of insured boilers and the insurance companies, and made necessary many personal visits to the steam plants in question. The results were very unsatisfactory, as, under the wording of the old law, chapter 105 of the Revised Laws, in many cases it would be claimed that "recommendations" were merely suggestions, and need not, therefore, be complied with.

Under the provisions of the present boiler inspection law, chapter 465 of the Acts of 1907, this department was relieved of the duty of enforcing the recommendations of the insurance companies, and the insurance companies now report "orders" on boilers inspected by them, the Legislature having eliminated the word "recommendations," and substituted therefor the word "orders," in that section of the law relating to the reports of inspections made by insurance companies to this department. The insurance companies are required to see that their orders are complied with before a certificate of inspection is issued.

Previous to Oct. 1, 1907, the only law as to appliances was sections 9, 10 and 11 of chapter 105 of the Revised Laws, reading as follows, and related solely to fusible plugs: —

Section 9. No person shall manufacture, set up or use a steam boiler or cause it to be used unless it is provided with a fusible

safety plug, made of lead or some other equally fusible material and of a diameter of not less than one-half inch, placed in the roof of the fire box, if a fire box is used, and in all cases, in a part of the boiler fully exposed to the action of the fire, and as near the top of the water line as any part of the fire surface of the boiler.

Section 10. Whoever, without just and proper cause, removes the safety plug from a boiler or substitutes therefor any material more capable of resisting the action of the fire than the plug so removed shall be punished by a fine of not more than one thousand dollars.

Section 11. Whoever manufactures, sets up or knowingly uses or causes to be used for six consecutive days a steam boiler, unprovided with a safety fusible plug as described in section nine, shall be punished by a fine of not more than one thousand dollars.

Under the provisions of section 6 of chapter 419 of the Acts of 1895, and in accordance therewith, this department drew up the following rules: —

Requirements of Boiler Inspection Department of District Police as to Fittings for Low-pressure Heating Boilers.

Upon all steam boilers used for heating purposes, having a grate area of over 2 square feet, and subject to inspection by this department, the following fittings must be provided, being deemed necessary for safety: —

One safety valve on each boiler, with no obstruction between valve and boiler. If pressure carried is to be below 25 pounds, the least area of the safety valve in inches is to be reckoned by dividing the area of grate in square feet by 2½ if a pop valve is used, or by 2 if a lever, dead weight or simple spring valve is used.

One steam gauge on each boiler, connected with syphon or equivalent device between gauge and boiler, to fill gauge spring with water. The supply pipe is to come from steam space of boiler.

Each boiler must have at least two try cocks, the lower one to be placed 2½ inches above fusible plug or lowest safe water line. Where a glass is also used, the lower end of glass must be above the fusible plug or lowest safe water line.

Each boiler must be provided with stop valve on main steam pipe leading from boiler. Each boiler must have check valve and stop valve on main return pipe.

Where a damper regulator is used, the pressure supply pipe must be taken from the steam space of the boiler.

Safety Valves for High Pressure.

If pressure carried is between 25 and 100 pounds, the area of safety valve in inches shall equal the area of grate in square feet divided by 3 for lever or dead weight valves, and by 3½ for pop valves. If pressure is above 100 pounds, divide by 5 for pop valves and 4 for lever or dead weight valves.

The foregoing, then, was all the actual law, and rules made in accordance with law, in existence relating to appliances required for the safety of steam boilers in this Commonwealth. There was no law whatever on factors of safety to be used, or rules for determining safe working pressure or efficiency of riveted joints, etc., and it will be readily seen that the results of boiler inspections were far from being uniform.

There were 13,739 reports of boiler inspections, made by the 8 companies authorized to insure boilers in this Commonwealth, received by this department for the year ending Oct. 31, 1908, as against 12,467 reports for the year ending Oct. 31, 1907. The supervision of these reports involved a large amount of purely clerical work, and an even greater amount of technical work which required to be done by inspectors of steam boilers of this department.

Every one of these reports was given personal supervision by this department, to see that the data called for by the report were all there, that the boiler was provided with the proper appliances for safety as prescribed by the rules formulated by the Board of Boiler Rules, or that the inspector had given the insured the necessary orders to supply the deficiency; also, to see that the proper factor of safety had been used and that the efficiency of the longitudinal joint was correct, and to make sure that the safe working pressure allowed was strictly in accordance with the rules formulated by the Board of Boiler Rules. This supervision also applied to the 3,698 reports on inspections made by the members of this department.

All the preceding involved a large amount of detail and technical work, certainly more than the previous boiler in-

spection law called for; but there is no comparison in the results obtained now with the results obtained then.

Previous to Oct. 1, 1907, the only certificates of inspection on steam boilers, posted in engine or boiler rooms in this Commonwealth, were those issued by the inspectors of this department. Since Oct. 1, 1907, every insurance company, as well as this department, is obliged to issue a standard form certificate of inspection, if the boiler is in safe working condition and provided with the proper appliances for safety; and said certificate is required to be signed by the inspector who made the inspection. A facsimile of the standard form certificate of inspection is shown on page 99 of this report.

The reports of inspectors of this department, and of the eight companies inspecting and insuring steam boilers and furnishing reports to this department, on boilers installed in this Commonwealth prior to May 1, 1908, are made out as completely as possible from the information obtainable; but in many cases even the name of the manufacturer of a boiler is unknown, and, when known, the records kept by such manufacturer are, as a rule, very incomplete.

In some cases, where this department endeavored to get information, the only data obtainable were the diameter and length of the boiler and the diameter and number of tubes.

Under the provisions of the rules formulated by the Board of Boiler Rules, every boiler manufacturer who builds and stamps a boiler Massachusetts standard is required to send, on forms furnished, a data report of such boiler to this department. A facsimile of boiler manufacturers' data report is shown on page 130 of this report.

The manufacturer is required to stamp the boiler "MASS. STD.," with a serial number and the name or initials of the manufacturer, so that the boiler can at any time and in any place be identified, and a correct record of its age and every important detail of construction can be obtained at the headquarters of this department, State House, Boston.

From May 1 to Oct. 31, 1908, 519 steam boilers have been constructed to the Massachusetts standard. In addition, 49 boilers designed by the manufacturers to the Massachu-

setts standard were found not to conform in all details to the rules formulated by the Board of Boiler Rules, and were not passed as standard boilers. All of the 568 data reports sent in by the different manufacturers have been given personal supervision by inspectors of this department, in much the same manner that this department inspectors' reports and reports on insured boilers are supervised, involving, of course, in the case of manufacturers' data reports, much more detail work in connection with specifications, blue prints, mill test reports, calculating efficiency of joints, staying, stay-bolting, shell construction, etc., and correspondence.

Section 28 of chapter 465 of the Acts of 1907 provides that the boiler inspection department of the District Police shall enforce such rules as shall be promulgated by the Board of Boiler Rules, with the approval of the Governor. This adds greatly to the work of this department, as in addition to the enforcement of the rules, the department has also the enforcement of chapter 102 of the Revised Laws, relating to the licensing of engineers and firemen: the supervision of engineers' record books; also chapter 465 of the Acts of 1907, relating to the inspection of steam boilers; and the examining, for certificates of competency, of inspectors of boilers employed by insurance companies.

During the year 10 applicants were examined for certificates of competency, and 4 certificates granted.

The engineers' and firemen's license law, the boiler inspection law and the rules formulated by the Board of Boiler Rules, cover the operation of steam engines, and the construction, installation, inspection and operation of steam boilers in this Commonwealth, from specifying the materials entering into the construction of steam boilers, to having daily records kept of the boilers when in service. The enforcement of all provisions of these laws, and of the rules formulated by the Board of Boiler Rules, is under the jurisdiction of this department.

There were 9 prosecutions, as shown in tabulated form on page 132 of this report, the fines imposed in 4 of these cases aggregating $40.

There has been received from members of the boiler inspection department, as fees for the inspection of boilers and examination of applicants for licenses as engineers and firemen, for the year ending Oct. 31, 1908, the sum of $22,066, which sum has been paid to the Treasurer and Receiver-General.

A complete issue of the rules formulated by the Board of Boiler Rules follows.

Commonwealth of Massachusetts.

BOARD OF BOILER RULES,
15 ASHBURTON PLACE, ROOM 301, FORD BUILDING,
BOSTON.

JOSEPH H. MCNEILL, *Chief Inspector Boiler Inspection Department*, *Chairman*.
JOHN A. STEVENS, M.E., *Representing Boiler-using Interests*.
FREDERIC H. KEYES, M.E., *Representing Boiler-using Interests*.
ROBERT J. DUNKLE, *Representing Boiler-insurance Interests*.
WILLIAM M. BECK, *Representing Operating Engineers*.
FREDERICK W. MACER, *Secretary*.

RULES

FORMULATED BY THE BOARD OF BOILER RULES.

[In Accordance with the Provisions of Section 26, Chapter 465, Acts of 1907, "An Act relative to the Operation and Inspection of Steam Boilers."]

The Rules previously issued and additions made thereto are arranged as follows: —

Part I. These rules, in addition to the rules contained in Part II., apply to boilers installed on or **before** May first, nineteen hundred and eight.

Part II. These rules apply to **all boilers** now or hereafter installed.

Part III. These rules, in addition to the rules contained in Part II., apply to boilers installed **after** May first, nineteen hundred and eight.

PART I.

These rules, in addition to the rules contained in Part II., apply to boilers installed on or **before** May first, nineteen hundred and eight.

Section 1.

To determine maximum allowable pressure.

1. The maximum pressure to be allowed on a boiler constructed of steel or wrought-iron shells or drums shall be determined from the minimum thickness of the shell plates, the lowest tensile strength stamped on the plates by the plate manufacturer, the efficiency of the longitudinal joint, the inside diameter of the outside course and the lowest factor of safety allowed by these rules, the formula being: —

$$\frac{\text{T. S.} \times \text{t} \times \%}{\text{R} \times \text{F. S.}} = \text{maximum allowable working pressure per square inch, in pounds.}$$

T. S. = tensile strength of shell plates in pounds.

t = minimum thickness of shell plates in inches.

% = efficiency of longitudinal joint, method of determining which is given in section 7, Part II. of these Rules.

R = radius = one-half (½) the inside diameter of the outside course of the shell or drum.

F. S. = lowest factor of safety allowed by these Rules.

Tensile strength.

2. When the tensile strength of steel or wrought-iron shell plates is *not* known, it shall be taken as fifty-five thousand (55,000) pounds for steel and forty-five thousand (45,000) pounds for wrought iron.

Factor of safety.

3. The lowest factor of safety to be used for boilers, the longitudinal joints of which are of butt and double strap construction, shall be four and five-tenths (4.5).

Note. — Factors of safety which also apply to boilers installed before May first, nineteen hundred and eight, are specified in paragraph 7, section 1, Part II. of these Rules.

Rivets.

4. When the diameter of the rivet holes in the longitudinal joints of a boiler is *not* known, the diameter and cross-sectional area of rivets, after driving, shall be taken as follows: —

Thickness of plate, .	1/4" .25"	9/32" .28125"	5/16" .3125"	11/32" .34375"	3/8" .375"	3/8" .375"	13/32" .40625"
Diameter of rivet after driving,	1 1/16"	1 1/16"	3/4"	3/4"	3/4" up to and including 2" pitch.	1 3/16" over 2" pitch.	1 3/16"
Cross-sectional area of rivet after driving, .	.3712 sq. in.	.3712 sq. in.	.4418 sq. in.	.4418 sq. in.	.4418 sq. in.	.5185 sq. in.	.5185 sq. in.

Thickness of plate, .	7/16" .4375"	7/16" .4375"	15/32" .46875"	1/2" .5"	9/16" .5625'	5/8" .625"
Diameter of rivet after driving,	7/8" up to and including 2 1/4" pitch.	1 5/16" over 2 1/4" pitch.	1 5/16"	1 5/16"	1 1/16"	1 1/16"
Cross-sectional area of rivet after driving, .	.6013 sq. in.	.6903 sq. in.	.6903 sq. in.	.6903 sq. in.	.8866 sq. in.	.8866 sq. in.

5. The minimum size of safety valve (other than a direct spring-loaded safety valve) shall be governed by the steam pressure at which it is set to blow, and the grate area of the boiler, as shown by the following table: — Safety valves, not spring-loaded.

Gage Pressure per Square Inch at which Safety Valve is set to blow.		Zero to 25 Pounds.	Over 25 to 50 Pounds.	Over 50 to 100 Pounds.
Diameter of Valve in Inches.	Area of Valve in Square Inches.	Area of Grate in Square Feet.		
1	.7854	1.4	1.6	1.8
1 1/4	1.2272	2.1	2.5	2.8
1 1/2	1.7671	3.0	3.6	4.0
2	3.1416	5.3	6.4	7.1
2 1/2	4.9087	8.2	10.0	11.0
3	7.0686	11.7	14.2	16.0
3 1/2	9.6211	16.0	19.5	21.6
4	12.5660	21.0	25.5	28.2
4 1/2	15.9040	26.7	32.3	36.0
5	19.6350	32.7	40.0	44.0

This table is in ratio to the table for direct spring-loaded safety valves, given in paragraph 2, section 2, Part II. of these Rules, as 2 is to 3.

6. Each boiler shall have a bottom blow-off pipe, fitted with a valve or cock, and in direct connection with the lowest water space of the boiler. Bottom blow-off.

PART II.

These rules apply to **all boilers** now or hereafter installed.

SECTION 1.

Maximum pressure.

1. The pressure allowed on a boiler constructed wholly of cast iron shall not exceed twenty-five (25) pounds per square inch.

2. The pressure allowed on a boiler, the tubes of which are secured to cast-iron headers, shall not exceed one hundred and sixty (160) pounds per square inch.

3. The pressure allowed on a boiler fitted with a district police lock-pop safety valve shall not exceed fifteen (15) pounds per square inch. This special type of safety valve is provided for by section 78, chapter 102 of the Revised Laws (Engineers' and Firemen's License Law), and applies to boilers used for heating purposes exclusively.

Crushing strength mild steel.

4. The resistance to crushing of mild steel shall be taken at ninety-five thousand (95,000) pounds per square inch cross-sectional area.

Shearing strength of rivets.

5. The maximum shearing strength of rivets per square inch of cross-sectional area shall be taken as follows: —

	Pounds.
Iron rivets in single shear,	38,000
Iron rivets in double shear,	70,000
Steel rivets in single shear,	42,000
Steel rivets in double shear,	78,000

6. The following table gives the allowable shearing strength of rivets from eleven-sixteenths (11/16) inch to one and one-sixteenth (1 1/16) inches in diameter, in pounds: —

Diameter of rivet after driving,	11/16" .6875"	3/4" .75"	13/16" .8125"	7/8" .875"	15/16" .9375"	1 1/16" 1.0625"
Cross-sectional area of rivet after driving,	.3712 sq. in.	.4418 sq. in.	.5185 sq. in.	.6013 sq. in.	.6903 sq. in.	.8866 sq. in.
	Allowable Shearing Strength in Pounds.					
Iron, single shear,	14,106	16,788	19,703	22,849	26,231	33,691
Iron, double shear,	25,984	30,926	36,295	42,091	48,321	62,062
Steel, single shear,	15,590	18,556	21,777	25,255	28,993	37,237
Steel, double shear,	28,954	34,460	40,443	46,901	53,843	69,155

Factors of safety.

7. The lowest factors of safety used for boilers, the shells or drums of which are exposed to the products of combustion and the longitudinal joints of which are of lap-riveted construction, shall be as follows: —

(*a*) Five (5) for boilers not over ten years old.

(*b*) Five and five-tenths (5.5) for boilers over ten and not over fifteen years old.

(*c*) Five and seventy-five hundredths (5.75) for boilers over fifteen and not over twenty years old.

(*d*) Six (6) for boilers over twenty years old.

(*e*) Five (5) for boilers, the longitudinal joints of which are of lap-riveted construction and the shells or drums of which are not exposed to the products of combustion.

8. The following table of areas gives the net area in square inches of any segment of a head to be stayed, as shown in Fig. 1: — Areas of segments.

Height from Tubes to Shell.	Diameter of Boiler.												
	24″	30″	36″	42″	48″	54″	60″	66″	72″	78″	84″	90″	96″
	Area to be stayed, in square inches.												
10″	57	68	77	85	93	99	106	112	117	123	129	132	137
11″	74	88	100	111	121	130	138	147	155	161	169	174	183
12″	91	109	125	139	151	163	174	184	194	203	213	219	230
13″	–	132	151	168	183	197	211	224	235	247	256	267	279
14″	–	155	178	199	217	234	250	266	280	294	305	319	331
15″	–	178	206	231	252	273	291	309	326	343	357	372	386
16″	–	–	235	263	289	312	334	355	374	394	411	423	443
17″	–	–	264	297	326	353	378	402	425	447	467	486	502
18″	–	–	–	331	365	396	424	450	476	500	520	543	564
19″	–	–	–	366	404	439	470	500	529	555	580	604	631
20″	–	–	–	401	444	483	519	552	583	613	642	667	699
21″	–	–	–	–	485	528	568	604	640	673	705	733	766
22″	–	–	–	–	526	574	618	658	697	734	769	800	835
23″	–	–	–	–	–	620	668	713	754	796	830	869	906
24″	–	–	–	–	–	667	719	768	814	859	897	939	978
25″	–	–	–	–	–	714	771	825	875	922	966	1,010	1,051
26″	–	–	–	–	–	761	824	882	936	987	1,035	1,083	1,126
27″	–	–	–	–	–	–	877	939	998	1,053	1,106	1,157	1,202
28″	–	–	–	–	–	–	930	997	1,060	1,120	1,177	1,232	1,279
29″	–	–	–	–	–	–	–	1,056	1,123	1,187	1,248	1,305	1,360
30″	–	–	–	–	–	–	–	1,115	1,187	1,255	1,321	1,382	1,442
31″	–	–	–	–	–	–	–	–	1,252	1,324	1,394	1,459	1,523
32″	–	–	–	–	–	–	–	–	1,317	1,394	1,467	1,538	1,605
33″	–	–	–	–	–	–	–	–	–	1,465	1,542	1,617	1,687
34″	–	–	–	–	–	–	–	–	–	1,536	1,617	1,695	1,770
35″	–	–	–	–	–	–	–	–	–	–	1,692	1,775	1,856
36″	–	–	–	–	–	–	–	–	–	–	–	1,857	1,941
37″	–	–	–	–	–	–	–	–	–	–	–	–	2,026

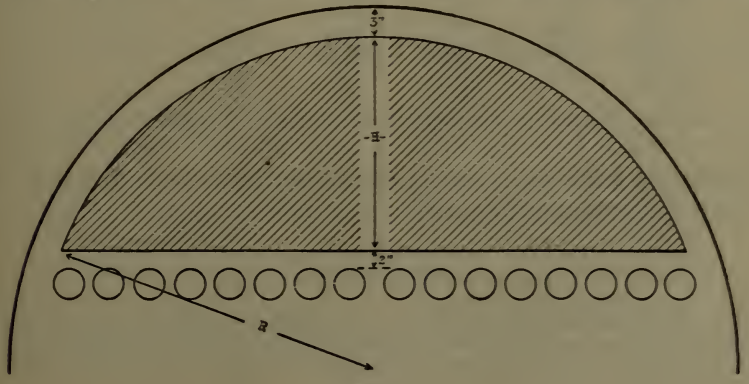


Fig. 1.

Formula to find area of segment.

9. When an area is required that is not given in the table (Paragraph 8), the following formula shall be used: —

$$\frac{4\,H^2}{3}\sqrt{\frac{2\,R}{H}-.608}=\text{Area of segment to be stayed, in square inches.}$$

H = distance from tubes to shell, minus five inches.
R = radius of boiler, minus three inches.

Section 2.

Safety valves.

1. Each boiler shall have one (1) or more safety valves, the minimum area or combined area of which shall be governed by the steam pressure at which the valve or valves are set to blow, and the grate area of the boiler.

This Board recommends the installation of more than one safety valve on a boiler permitted to carry over twenty-five (25) pounds pressure per square inch.

Safety valves, spring-loaded.

2. A table of areas of grate surface in square feet for direct spring-loaded safety valves follows: —

	$W=\frac{75}{3600}$ $P=40$ $A=.401$	$W=\frac{100}{3600}$ $P=65$ $A=.329$	$W=\frac{160}{3600}$ $P=115$ $A=.297$	$W=\frac{160}{3600}$ $P=140$ $A=.244$	$W=\frac{200}{3600}$ $P=190$ $A=.224$	$W=\frac{240}{3600}$ $P=240$ $A=.213$
Gage Pressure per Square Inch at which Safety Valve is set to blow.	Zero to 25 Pounds.	Over 25 to 50 Pounds.	Over 50 to 100 Pounds.	Over 100 to 150 Pounds.	Over 150 to 200 Pounds.	Over 200 Pounds.
Diameter of Valve in Inches.	Area of Valve in Square Inches.	Area of Grate in Square Feet.				
1	.7854	2.0	2.4	2.7	3.2	3.5	3.7
1¼	1.2272	3.1	3.8	4.2	5.0	5.5	5.7
1½	1.7671	4.5	5.4	6.0	7.2	7.9	8.3
2	3.1416	7.9	9.6	10.6	12.9	14.0	14.8
2½	4.9087	12.3	15.0	16.5	20.0	21.9	23.0
3	7.0686	17.6	21.3	23.8	29.0	31.5	33.2
3½	9.6211	24.0	29.3	32.4	39.4	42.9	45.2
4	12.5660	31.4	38.2	42.3	51.5	56.0	59.0
4½	15.9040	40.0	48.4	53.5	65.0	71.0	74.7
5	19.6350	49.0	60.0	66.0	80.0	88.0	92.1

3. When the conditions exceed those on which the table (paragraph 2) is based the following formula shall be used: —

$$A=\frac{W}{P}\times\frac{70}{11}.$$

A = area of direct spring-loaded safety valve in square inches per square foot of grate surface.
W = weight of water in pounds evaporated per square foot of grate surface per second.
P = pressure (absolute) at which the safety valve is set to blow.

4. A table of areas of grate surface in square feet for safety valves, not direct spring-loaded, is given in paragraph 5, section 1, Part I. of these Rules.

5. If more than one (1) safety valve is used, the minimum combined area shall be in accordance with the table.

Safety valve connections.

6. Each safety valve shall have full-sized direct connection to the boiler, and when an escape pipe is used it shall be full-sized and fitted with an open drain, to prevent water lodging in the upper part of safety valve or escape pipe. When a boiler is fitted with two (2) safety valves on one (1) connection, this connection to the boiler shall have a cross-sectional area equal to or greater than the combined area of the two (2) safety valves. No valve of any description shall be placed between the safety valve and the boiler, nor on the escape pipe between the safety valve and the atmosphere. When an elbow is placed on a safety valve escape pipe it shall be located close to the safety valve outlet, or the escape pipe shall be securely anchored and supported.

7. Safety valves having either the seat or disc of cast iron shall not be used.

Safety valves hereafter installed.

8. Safety valves hereafter installed on boilers shall not exceed five (5) inches in diameter, and shall be the direct spring-loaded type, with seat and bearing surface of the disc inclined at an angle of about forty-five (45) degrees to the centre line of the spindle; designed with a substantial lifting device so that the disc can be lifted from its seat with the spindle, not less than one-eighth ($\frac{1}{8}$) the diameter of the valve, when the pressure on the boiler is seventy-five (75) per cent. of that at which the safety valve is set to blow.

Fusible plugs.

9. Fusible plugs, as required by section 20, chapter 465, Acts of 1907, shall be filled with pure tin.

10. The least diameter of fusible metal shall not be less than one-half ($\frac{1}{2}$) inch, except for working pressures of over one hundred and seventy-five (175) pounds, or when it is necessary to place a fusible plug in a tube, in which cases the least diameter of fusible metal shall not be less than three-eighths ($\frac{3}{8}$) inch.

11. Each boiler shall have one (1) or more fusible plugs located as follows: —

(*a*) In Horizontal Return Tubular Boilers — in the rear head, not less than two (2) inches above the upper row of tubes, measurement to be taken from the line of the upper surface of tubes to the centre of the plug, as shown in Figs. 13 and 14 of these Rules, and projecting through the sheet not less than one (1) inch.

(*b*) In Horizontal Flue Boilers — in the rear head, on a line with the highest part of the boiler exposed to the products of combustion, and projecting through the sheet not less than one (1) inch.

(*c*) In Locomotive Type or Star Water Tube Boilers — in the highest

part of the crown sheet, and projecting through the sheet not less than one (1) inch.

(*d*) In Vertical Fire Tube Boilers — in an outside tube, not less than one-third ($\frac{1}{3}$) the length of the tube above the lower tube sheet.

(*e*) In Vertical Fire Tube Boilers, Corliss Type — in a tube not less than one-third ($\frac{1}{3}$) the length of the tube above the lower tube sheet.

(*f*) In Vertical Submerged Tube Boilers — in the upper tube sheet.

(*g*) In Water Tube Boilers, Horizontal Drums, Babcock & Wilcox Type — in the upper drum, not less than six (6) inches above the bottom of the drum, over the first pass of the products of combustion, and projecting through the sheet not less than one (1) inch.

(*h*) In Stirling Boilers, Standard Type — in the front side of the middle drum, not less than four (4) inches above the bottom of the drum, and projecting through the sheet not less than one (1) inch.

(*i*) In Stirling Boilers, Superheater Type — in the front drum, not less than six (6) inches above the bottom of the drum, exposed to the products of combustion, and projecting through the sheet not less than one (1) inch.

(*j*) In Water Tube Boilers, Heine Type — in the front course of the drum, not less than six (6) inches above the bottom of the drum, and projecting through the sheet not less than one (1) inch.

(*k*) In Robb-Mumford Boilers, Standard Type — in the bottom of the steam and water drum, twenty-four (24) inches from the centre of the rear neck, and projecting through the sheet not less than one (1) inch.

(*l*) In Water Tube Boilers, Almy Type — in a tube or fitting exposed to the products of combustion.

(*m*) In Vertical Boilers, Climax or Hazelton Type — in a tube or centre drum not less than one-half ($\frac{1}{2}$) the height of the shell, measuring from the lowest circumferential seam.

(*n*) In Cahall Vertical Water Tube Boilers — in the inner sheet of the top drum, not less than six (6) inches above the upper tube sheet, and projecting through the sheet not less than one (1) inch.

(*o*) In Scotch Marine Type Boilers — in combustion chamber top, and projecting through the sheet not less than one (1) inch.

(*p*) In Dry Back Scotch Type Boilers — in rear head, not less than two (2) inches above the upper row of tubes, and projecting through the sheet not less than one (1) inch.

(*q*) In Economic Type Boilers — in the rear head above the upper row of tubes.

(*r*) In Cast-Iron Sectional Heating Boilers — in a section over and in direct contact with the products of combustion in the primary combustion chamber.

(*s*) In Water Tube Boilers, Worthington Type — in the front side of the steam and water drum, not less than four (4) inches above the bottom of

the drum, and projecting through the sheet not less than one (1) inch. [*Approved June 9, 1908.*

(*t*) For other types and new designs, fusible plugs shall be placed at the lowest permissible water level, in the direct path of the products of combustion, as near the primary combustion chamber as possible.

Steam gage. 12. Each boiler shall have a steam gage connected to the steam space of the boiler by a syphon, or equivalent device, sufficiently large to fill the gage tube with water, and in such manner that the steam gage cannot be shut off from the boiler except by a cock with T or lever handle, which shall be placed on the pipe near the steam gage.

13. The dial of the steam gage shall be graduated to not less than one and one-half ($1\frac{1}{2}$) times the maximum pressure allowed on the boiler.

Attaching test gage. 14. Each boiler shall be provided with a one-fourth ($\frac{1}{4}$) inch pipe size connection for attaching inspector's test gage when boiler is in service, so that the accuracy of the boiler steam gage can be ascertained, as required by section 3, chapter 465, Acts of 1907.

Water glass. 15. Each boiler shall have one (1) water glass, the bottom end of which shall be above the fusible plug and lowest safe water line.

Gage cocks. 16. Each boiler shall have two (2) or more gage cocks, located within the range of the water glass, when the maximum pressure allowed does not exceed twenty-five (25) pounds per square inch.

17. Each boiler shall have three (3) or more gage cocks, located within the range of the water glass, when the maximum pressure allowed exceeds twenty-five (25) pounds per square inch.

Feed pipe. 18. Each boiler shall have a feed pipe fitted with a check valve, and also a stop valve or stop cock between the check valve and the boiler, the feed water to discharge below the lowest safe water line. Means must be provided for feeding the boiler with water when the maximum pressure allowed is carried on the boiler

Stop valve. 19. Each steam outlet from a boiler (except safety valve connections) shall be fitted with a stop valve.

20. When a stop valve is so located that water can accumulate, ample drains shall be provided.

Damper regulator. 21. When a damper regulator is used, the boiler pressure pipe shall be fitted with a valve or cock, and shall be connected to the steam space of the boiler. [*Approved June 9, 1908.*

Lamphrey fronts. 22. Each boiler fitted with a Lamphrey Boiler Furnace Mouth Protector, or similar appendage, having valves on the pipes connecting the same with the boiler, shall have these valves locked or sealed *open*, so that the locks or seals will require to be removed or broken to shut the valves.

Valves on return pipes.

23. The main return pipe to a heating boiler (Gravity Return System) shall have a check valve, and also a stop valve between the check valve and the boiler.

24. When there are two connected boilers (Gravity Return System), one (1) check valve may be placed on the main return pipe and a stop valve on the branch pipe to each boiler, as shown in Fig. 2.

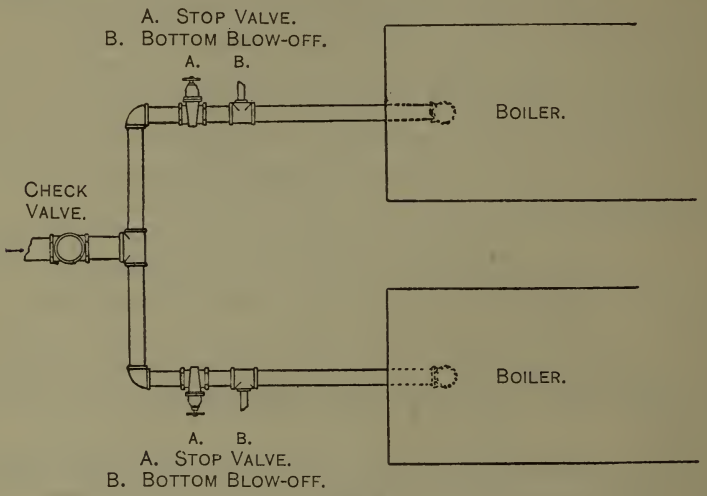


Fig. 2.

Section 3.

Horse power rating.

1. A boiler having one square foot of grate surface shall be rated at three (3) horse power when the safety valve is set to blow at over twenty-five (25) pounds pressure per square inch.

2. A boiler having two square feet of grate surface shall be rated at three (3) horse power when the safety valve is set to blow at twenty-five (25) pounds pressure per square inch, or less.

Section 4.

Annual internal inspections.

1. The owner or user of a boiler which requires annual inspection, internally and externally, by the boiler inspection department or by an insurance company, as provided by section 1, chapter 465, Acts of 1907, shall prepare the boiler for inspection by cooling it down (blanking off connections to adjacent boilers if necessary), removing all soot and ashes from tubes, heads, shell, furnace and combustion chamber; drawing off the water; removing the handhole and manhole plates; removing the grate bars from internally fired boilers; and removing the steam gage for testing.

2. If a boiler has not been properly cooled down, or otherwise prepared for inspection, the boiler inspector shall decline to inspect it, and he shall not issue a certificate of inspection until efficient inspection has been made.

3. In making the annual internal and external inspection as provided by sections 1 and 4, chapter 465, Acts of 1907, the boiler inspector shall apply the hammer test to all internal and external parts of a boiler that are accessible.

4. All proper measurements shall be taken by the boiler inspector, so that the maximum working pressure allowed on a boiler will conform to the rules relating to allowable pressures established by the Board of Boiler Rules; such measurements to be taken and calculations made before a hydrostatic pressure test is applied to a boiler.

5. The steam gage of a boiler shall be tested and its readings compared with an accurate test gage, and if, in the judgment of the boiler inspector, the gage is not reliable he shall order it repaired or replaced.

SECTION 5.

Annual external inspections.

1. The annual external inspection of a boiler, as provided by section 3, chapter 465, Acts of 1907, should be made at or about six (6) months after the annual internal inspection, except in the case of a boiler that is in service a portion of the year only, in which case the annual external inspection shall be made during such period of service.

2. The boiler inspector shall attach an accurate test gage to a boiler to note the pressure shown by said test gage, and compare it with that shown by the boiler gage, ordering the boiler gage repaired or replaced if necessary.

3. The boiler inspector shall see that the water glass, gage cocks, water-column connections and water blow-offs are free and clear; also that the safety valve raises freely from its seat.

4. Fire doors, tube doors and doors in settings shall be opened, to view as far as possible the fire surface, settings, tube ends, blow-off pipes and fusible plug; the boiler inspector to note conditions and order changes or repairs if necessary.

SECTION 6.

Hydrostatic pressure tests.

1. When a boiler is tested by hydrostatic pressure, the maximum pressure applied shall not exceed one and one-half ($1\frac{1}{2}$) times the maximum allowable working pressure; except that twice the maximum allowable working pressure may be applied on boilers permitted to carry not over twenty-five (25) pounds pressure per square inch, or on pipe boilers.

2. When making annual inspections on boilers constructed wholly of cast-iron, or on pipe boilers, a hydrostatic pressure test of not less than one and one-half ($1\frac{1}{2}$) times and not more than twice the maximum allowable working pressure shall be applied.

3. The boiler inspector, after applying a hydrostatic pressure test, shall thoroughly examine every accessible part of the boiler, both internal and external.

Section 7.

Efficiency of joint.

1. The efficiency that a unit of length of a riveted joint has to the same unit of length of solid plate shall be calculated as shown by the following examples: —

T. S. = tensile strength of plate in pounds per square inch.
t = thickness of plate in inches.
P = pitch of rivets in inches, on row having greatest pitch.
d = diameter of rivets after driving, in inches.
a = cross-sectional area of rivets after driving, in square inches.
s = strength of rivets in single shear, as given in paragraph 5, section 1, Part II. of these Rules.
S = strength of rivets in double shear, as given in paragraph 5, section 1, Part II. of these Rules.
n = number of rivets in single shear in a unit of length of joint.
N = number of rivets in double shear in a unit of length of joint.

Lap single-riveted.

2. *Example.* — Lap joint, longitudinal or circumferential, single-riveted.

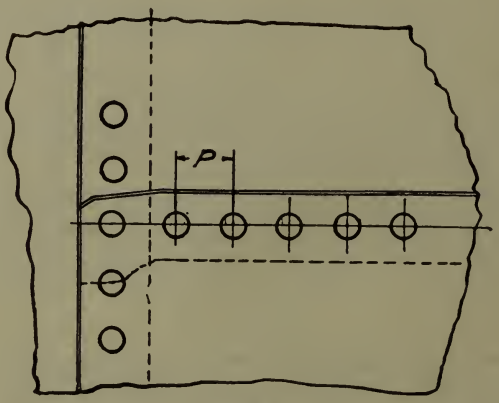


Fig. 3.

Strength of solid plate = P × t × T. S. = A.
Strength of plate between rivet holes = (P — d) t × T. S. = B.
Shearing strength of one rivet in single shear = nsa = C.

Divide B or C (whichever is the least) by A, and the quotient will be the efficiency of a single-riveted lap joint.

T. S. = 55,000 pounds.
t = $\frac{1}{4}''$ = .25″.
P = 1 $\frac{5}{8}''$ = 1.625″.

$d = \frac{11}{16}'' = .6875''$.
$a = .3712$ square inches.
$s = 42{,}000$ pounds.
$A = 1.625 \times .25 \times 55{,}000 = 22{,}343$.
$B = (1.625 - .6875) \times .25 \times 55{,}000 = 12{,}890$.
$C = 1 \times .3712 \times 42{,}000 = 15{,}590$.

$\frac{12{,}890\ (B)}{22{,}343\ (A)} = .576$, Efficiency of joint.

3. *Example.* — Lap joint, longitudinal or circumferential, double-riveted. Lap double-riveted.

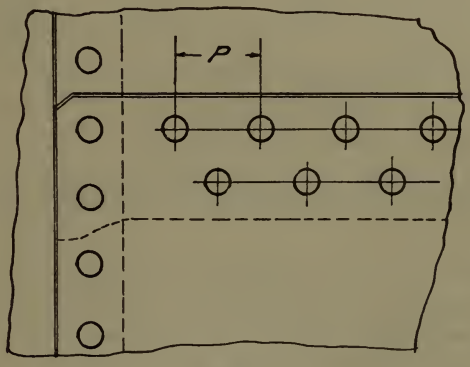


Fig. 4.

Strength of solid plate $= P \times t \times$ T. S. $= A$.
Strength of plate between rivet holes $= (P - d)\ t \times$ T. S. $= B$.
Shearing strength of two (2) rivets in single shear $= nsa = C$.

Divide B or C (whichever is the least) by A, and the quotient will be the efficiency of a double-riveted lap joint.

T. S. $= 55{,}000$ pounds.
$t = \frac{5}{16}'' = .3125''$.
$P = 2\ \frac{7}{8}'' = 2.875''$.
$d = \frac{3}{4}'' = .75''$.
$a = .4418$ square inches.
$s = 42{,}000$ pounds.
$A = 2.875 \times .3125 \times 55{,}000 = 49{,}414$.
$B = (2.875 - .75) \times .3125 \times 55{,}000 = 36{,}523$.
$C = 2 \times .4418 \times 42{,}000 = 37{,}111$.

$\frac{36{,}523\ (B)}{49{,}414\ (A)} = .739$, Efficiency of joint.

Butt double-riveted.

4. *Example.* — Butt and double strap joint, double-riveted.

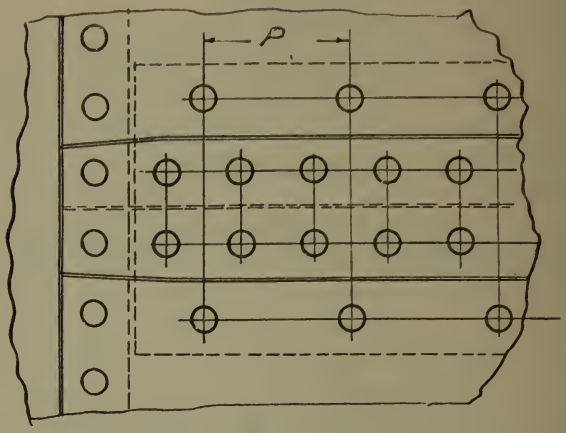


Fig. 5.

Strength of solid plate = P × t × T. S. = A.

Strength of plate between the rivet holes on the outer row = (P — d)t × T. S. = B.

Shearing strength of two (2) rivets in double shear, plus the shearing strength of one (1) rivet in single shear = NSa + nsa = C.

Strength of plate between rivet holes on second row, plus the shearing strength of one (1) rivet in single shear, in the outer row = (P — 2d)t × T. S. + nsa = D.

Divide B, C, or D (whichever is the least) by A, and the quotient will be the efficiency of a butt and double strap joint, double-riveted.

T. S. = 55,000 pounds.
t = $\frac{3}{8}$″ = .375″.
P = 4$\frac{3}{4}$″ = 4.75″.
d = $\frac{13}{16}$″ = .8125″.
a = .5185 square inches.
s = 42,000 pounds.
S = 78,000 pounds.

Number of rivets in single shear in a unit of length of joint = 1.

Number of rivets in double shear in a unit of length of joint = 2.

A = 4.75 × .375 × 55,000 = 97,969.

B = (4.75 — .8125) × .375 × 55,000 = 81,211.

C = 2 × 78,000 × .5185 + 1 × 42,000 × .5185 = 102,663.

D = (4.75 — 2 × .8125) × .375 × 55,000 + 1 × 42,000 × .5185 = 86,230.

$$\frac{81,211\ (B)}{97,969\ (A)} = .829, \text{ Efficiency of joint.}$$

5. *Example.* — Butt and double strap joint, triple-riveted. Butt triple-riveted.

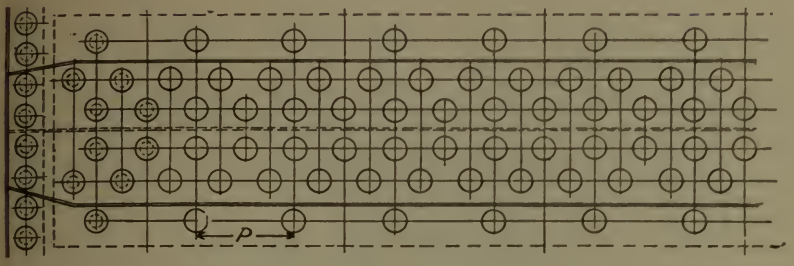


FIG. 6.

Strength of solid plate = P × t × T. S. = A.

Strength of plate between rivet holes on the outer row = (P — d) t × T. S. = B.

Shearing strength of four (4) rivets in double shear, plus the shearing strength of one (1) rivet in single shear = NSa + nsa = C.

Strength of plate between rivet holes on second row, plus the shearing strength of one (1) rivet in single shear in the outer row = (P — 2d) t × T. S. + nsa = D.

Divide B, C, or D (whichever is the least) by A, and the quotient will be the efficiency of a butt and double strap joint, triple-riveted.

T. S. = 55,000 pounds.
t = $\frac{3}{8}$″ = .375″.
P = 6$\frac{1}{2}$″ = 6.5″.
d = $\frac{13}{16}$″ = .8125″.
a = .5185 square inches.
s = 42,000 pounds.
S = 78,000 pounds.

Number of rivets in single shear in a unit of length of joint = 1.

Number of rivets in double shear in a unit of length of joint = 4.

A = 6.5 × .375 × 55,000 = 134,062.

B = (6.5 — .8125) × .375 × 55,000 = 117,304.

C = 4 × 78,000 × .5185 + 1 × 42,000 × .5185 = 183,549.

D = (6.5 — 2 × .8125) × .375 × 55,000 + 1 × 42,000 × .5185 = 122,323.

$$\frac{117,304\ (B)}{134,062\ (A)} = .875,\ \text{Efficiency of joint.}$$

Butt quadruple-riveted.

6. *Example.* — Butt and double strap joint, quadruple-riveted.

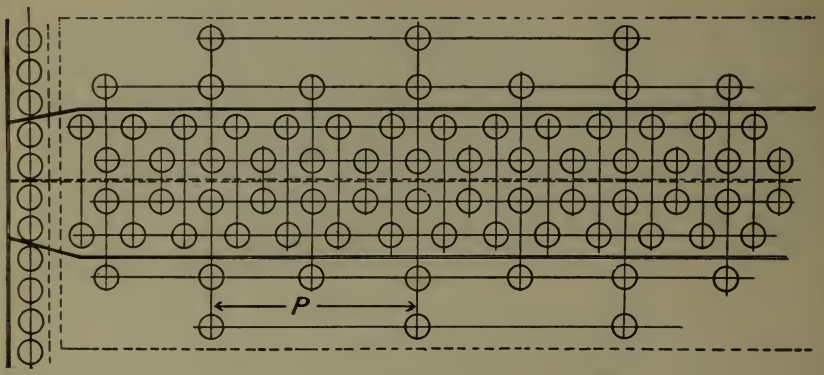


FIG. 7.

Strength of solid plate = P × t × T. S. = A.

Strength of plate between rivet holes on the outer row = (P − d) t × T.S. = B.

Shearing strength of eight (8) rivets in double shear, plus the shearing strength of three (3) rivets in single shear = NSa + nsa = C.

Strength of plate between the rivet holes on the second row, plus the shearing strength of one (1) rivet in single shear in the outer row = (P − 2d) t × T. S. + nsa = D.

Divide B, C, or D (whichever is the least) by A, and the quotient will be the efficiency of a butt and double strap joint, quadruple-riveted.

T. S. = 55,000 pounds.
t = $\frac{1}{2}''$ = .5″.
P = 15″.
d = $\frac{15}{16}''$ = .9375″.
a = .6903 square inches.
s = 42,000 pounds.
S = 78,000 pounds.

Number of rivets in single shear in a unit of length of joint = 3
Number of rivets in double shear in a unit of length of joint = 8.

A = 15 × .5 × 55,000 = 412,500.

B = (15 − .9375) × .5 × 55,000 = 386,718.

C = 8 × 78,000 × .6903 + 3 × 42,000 × .6903 = 517,723.

D = (15 − 2 × .9375) × .5 × 55,000 + 1 × 42,000 × .6903 = 389,930.

$\frac{386,718\ (B)}{412,500\ (A)}$ = .937, Efficiency of joint.

Section 8.

Form of certificate.

1. The standard size of the certificate of inspection, as authorized by section 26, chapter 465, Acts of 1907, shall be eleven (11) inches in width and eight and one-half ($8\frac{1}{2}$) inches in length, and shall be made up and worded in accordance with the following copy, space having been provided for the insertion of the State Boiler Inspection Department or the name of the insurance company using the same:

Commonwealth of Massachusetts

ANNUAL CERTIFICATE

OF

STEAM BOILER INSPECTION

As required by Chapter 465, Acts of 1907

[Space for Company's Name or State Boiler Inspection Department]

Boiler No._____ Date of Inspection_____, 19

This is to Certify that the herein-described steam boiler inspected by

[Space for Company's Name or State Boiler Inspection Department]

may be operated at a **Pressure not to exceed**_____ **pounds per square inch.**

Name of owner_____ Type of boiler_____

Location of boiler_____

Age in years_____ Built by_____

Length of shell or drum _____ ft. _____ in. Diameter of shell or drum _____ in.

Lowest tensile strength of shell plates_____ lbs. per sq. in. Number and size of tubes_____

Thickness of shell plates_____ in. Thickness of heads_____ in.

Style of longitudinal joint in shell or drum_____

Percentage of strength of longitudinal joint_____ Location of fusible plug_____

[Company's Name or State Boiler Inspection Department]

Signature_____

[Fac. Sim. of Executive Officer's or Chief Inspector's Signature]

Inspector of Boilers.

[Office]

In accordance with Section 21, Chapter 465, Acts of 1907, notify this department / company at once if any defect is discovered.

☞ **POST UNDER GLASS IN CONSPICUOUS PLACE IN ENGINE OR BOILER ROOM.** ☜

Certificate not to be removed.

2. The certificate of inspection shall be posted under glass in a conspicuous place in the engine or boiler room in which the boiler specified therein is located, and it shall not be removed therefrom except the boiler becomes defective, or a new certificate is issued, when it shall be removed by a member of the boiler inspection department of the district police, or an inspector holding a certificate of competency as an inspector of steam boilers, as provided by section 6, chapter 465, Acts of 1907.

PART III.

These rules, in addition to the rules contained in Part II., apply to boilers installed after May first, nineteen hundred and eight.

Section 1.

Open-Hearth Boiler Plate and Rivet Steel.

Process. 1. Steel shall be made by the open-hearth process, and will be considered as manufactured by the basic method unless the report of test states that the acid method has been used.

Steel plates and rivets. 2. All plates and rivets used in the construction of steel shells or drums of boilers shall be as specified by the American Society for Testing Materials, adopted 1901.

Chemical Properties.

Chemical properties. 3. There shall be three classes of open-hearth boiler plate and rivet steel, namely, Flange or Boiler Steel, Fire-Box Steel and Extra Soft Steel, which shall conform to the following limits in chemical composition: —

	Flange or Boiler Steel (Per Cent.).	Fire-Box Steel (Per Cent.).	Extra Soft Steel (Per Cent.).
Phosphorus shall not exceed	Acid, 0.06 Basic, 0.04	Acid, 0.04 Basic, 0.03	Acid, 0.04 Basic, 0.04
Sulphur shall not exceed	0.05	0.04	0.04
Manganese,	0.30 to 0.60	0.30 to 0.50	0.30 to 0.50

Boiler rivet steel. 4. Steel for boiler rivets shall be of the Extra Soft class, as specified in paragraphs Nos. 3 and 5 of this section.

Physical Properties.

Physical properties. 5. The three classes of open-hearth boiler plate and rivet steel — namely, Flange or Boiler Steel, Fire-Box Steel and Extra Soft Steel — shall conform to the following physical qualities: —

	Flange or Boiler Steel.	Fire-Box Steel.	Extra Soft Steel.
Tensile strength, pounds per square inch,	55,000 to 65,000	52,000 to 62,000	45,000 to 55,000
Yield point in pounds per square inch shall not be less than	½ T. S.	½ T. S.	½ T. S.
Elongation per cent. in eight inches shall not be less than	25	26	28

6. For material less than five-sixteenths ($\frac{5}{16}$) inch and more than three-fourths ($\frac{3}{4}$) inch in thickness the following modifications shall be made in the requirements for elongation: — Modifications in elongation for thin and thick material.

(*a*) For each increase of one-eighth ($\frac{1}{8}$) inch in thickness above three-fourths ($\frac{3}{4}$) inch a deduction of one (1) per cent. shall be made from the specified elongation.

(*b*) For each decrease of one-sixteenth ($\frac{1}{16}$) inch in thickness below five-sixteenths ($\frac{5}{16}$) inch a deduction of two and one-half ($2\frac{1}{2}$) per cent. shall be made from the specified elongation.

7. The three classes of open-hearth boiler plate and rivet steel shall conform to the following bending tests; and for this purpose the test specimen shall be one and one-half ($1\frac{1}{2}$) inches wide, if possible, and for all material three-fourths ($\frac{3}{4}$) inch or less in thickness the test specimen shall be of the same thickness as that of the finished material from which it is cut, but for material more than three-fourths ($\frac{3}{4}$) inch thick the bending test specimen may be one-half ($\frac{1}{2}$) inch thick. Bending tests.

Rivet rounds shall be tested of full size as rolled.

(*c*) Test specimens cut from the rolled material, as specified above, shall be subjected to a cold bending test and also to a quenched bending test. The cold bending test shall be made on the material in the condition in which it is to be used, and prior to the quenched bending test the specimen shall be heated to a light cherry red, as seen in the dark, and quenched in water, the temperature of which is between 80° and 90° Fahrenheit.

(*d*) Flange or boiler steel, fire-box steel and rivet steel, both before and after quenching, shall bend cold one hundred and eighty (180) degrees flat on itself without fracture on the outside of the bent portion.

8. For fire-box steel a sample taken from a broken tensile test specimen shall not show any single seam or cavity more than one-fourth ($\frac{1}{4}$) inch long in either of the three fractures obtained on the test for homogeneity, as described in paragraph No. 13 of this section. Homogeneity tests.

Test Pieces and Methods of Testing.

9. The standard test specimen of eight (8) inch gaged length shall be used to determine the physical properties specified in paragraphs Nos. 5 and 6 of this section. The standard shape of the test specimen for sheared plates shall be as shown in Fig. 8. Test Specimen for Tensile Test.

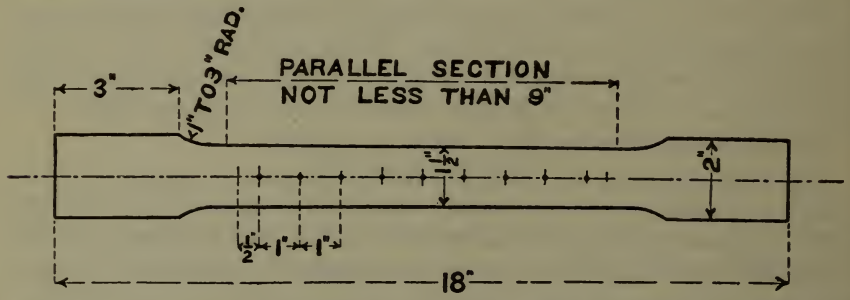
For other material the test specimen may be the same as for sheared plates, or it may be planed or turned parallel throughout its entire length; and in all cases, where possible, two opposite sides of the test specimens shall be the rolled surfaces. Rivet rounds and small rolled bars shall be tested of full size as rolled.

10. One tensile test specimen will be furnished from each plate as it is rolled, and two tensile test specimens will be fur- Number of tensile tests.

nished from each melt of rivet rounds. In case any of these develops flaws or breaks outside of the middle third of its gauged length, it may be discarded and another test specimen substituted therefor.

Test specimens for bending.

11. For material three-fourths ($\frac{3}{4}$) inch or less in thickness the bending test specimen shall have the natural rolled surface on two opposite sides. The bending test specimens cut from plates shall be one and one-half ($1\frac{1}{2}$) inches wide, and for material more than three-fourths ($\frac{3}{4}$) inch thick the bending test specimen may be one-half ($\frac{1}{2}$) inch thick. The sheared edges of bending test specimens may be milled or planed. The bending test specimens for rivet rounds shall be of full size as rolled. The bending tests may be made by pressure or by blows.



Standard Test Specimen of 8″ Gauged Length, Piece to be of Same Thickness as Plate.
FIG. 8.

Number of bending tests.

12. One cold bending specimen and one quenched bending specimen will be furnished from each plate as it is rolled. Two cold bending specimens and two quenched bending specimens will be furnished from each melt of rivet rounds. The homogeneity test for fire-box steel shall be made on one of the broken tensile test specimens.

Homogeneity tests for fire-box steel.

13. The homogeneity test for fire-box steel is made as follows: A portion of the broken tensile test specimen is either nicked with a chisel or grooved on a machine, transversely about one sixteenth ($\frac{1}{16}$) of an inch deep, in three places about two (2) inches apart. The first groove should be made on one side two (2) inches from the square end of the specimen; the second, two (2) inches from it on the opposite side; the third, two (2) inches from the last, and on the opposite side from it. The test specimen is then put in a vise, with the first groove about one-fourth ($\frac{1}{4}$) of an inch above the jaws, care being taken to hold it firmly. The projecting end of the test specimen is then broken off by means of a hammer, a number of light blows being used, and the bending being away from the groove. The specimen is broken at the other two grooves in the same way. The object of this treatment is to open and render visible to the eye any seams due to failure to weld up, or to foreign interposed matter or cavities due to gas bubbles in the ingot.

After rupture, one side of each fracture is examined, a pocket lens being used, if necessary, and the length of the seams and cavities is determined.

Yield point.

14. For the purposes of this specification the yield point shall be determined by the careful observation of the drop of the beam or halt in the gage of the testing machine.

Sample for chemical analysis.

15. In order to determine if the material conforms to the chemical limitations prescribed in paragraph No. 3 of this section, analysis shall be made of drillings taken from a small test ingot. An additional check analysis may be made from a tensile specimen of each melt used on an order, other than in locomotive fire-box steel. In the case of locomotive fire-box steel a check analysis may be made from the tensile specimen from each plate as rolled.

Variation in Weight.

Variation in weight.

16. The variation in cross section of weight of more than 2½ per cent. from that specified will be sufficient cause for rejection, except in the case of sheared plates, which will be covered by the following permissible variations: —

(*e*) Plates 12½ pounds per square foot or heavier, up to 100 inches wide, when ordered to weight, shall not average more than 2½ per cent. variation above or 2½ per cent. below the theoretical weight; when 100 inches wide and over, 5 per cent. above or 5 per cent. below the theoretical weight.

(*f*) Plates under 12½ pounds per square foot, when ordered to weight, shall not average a greater variation than the following: — Up to 75 inches wide, 2½ per cent. below the theoretical weight; 75 inches wide up to 100 inches wide, 5 per cent. below the theoretical weight; when 100 inches wide and over, 10 per cent. above or 3 per cent. below the theoretical weight.

(*g*) For all plates ordered to gage there will be permitted an average excess of weight over that corresponding to the dimensions on the order equal in amount to that specified in the following table: —

TABLE OF ALLOWANCES FOR OVERWEIGHT FOR RECTANGULAR PLATES WHEN ORDERED TO GAGE.

[Plates will be considered up to gage if measuring not over 1-100 inch less than the ordered gage. The weight of 1 cubic inch of rolled steel is assumed to be .2833 pound.]

Plates 1-4 Inch and Over in Thickness.

Thickness of Plate (Inch).	Width of Plate.		
	Up to 75 Inches (Per Cent.).	75 to 100 Inches (Per Cent.).	Over 100 Inches (Per Cent.).
¼	10	14	18
5/16	8	12	16
3/8	7	10	13
7/16	6	8	10
½	5	7	9
9/16	4½	6½	8½
5/8	4	6	8
Over 5/8	3½	5	6½

Finish.

Finish. 17. All finished material shall be free from injurious surface defects and laminations, and must have a workmanlike finish.

Plate Manufacturer to stamp Plates and Heads.

Plates to be stamped. 18. Each plate shall be distinctly stamped by the manufacturer with the heat number, and in at least five places in the following manner: At the four corners, at a distance of about twelve (12) inches from the edges, and at or near the center of the plate, with the name of the manufacturer, place where manufactured, brand and lowest tensile strength.

Heads to be stamped. 19. Each head shall be distinctly stamped by the manufacturer on each side with the name of the manufacturer, place where manufactured, brand and lowest tensile strength; stamps to be so located as to be plainly visible when the head is finished.

SECTION 2.

Material to be used.

Shell plates. 1. **Shells, drums and butt straps shall be of Open-Hearth Fire-Box Steel,** as specified in paragraphs Nos. 3 and 5, section 1, Part III. of these Rules.

Heads. 2. Heads, combustion chambers, furnaces, or any plates that require staying or flanging, shall be of Open-Hearth Flange, Fire-Box or Extra Soft Steel, as specified in paragraphs Nos. 3 and 5, section 1, Part III. of these Rules.

Rivets. 3. Rivets shall be of Open-Hearth Extra Soft Steel, as specified in paragraphs Nos. 3 and 5, section 1, Part III. of these Rules.

Cast steel. 4. Cast steel for use in boiler and steam superheater mountings, manhole frames, steam pipe, fittings, side lugs, or any other parts of boilers or superheaters where cast steel is used, shall not have less than fifty thousand (50,000) pounds tensile strength.

Cast iron. 5. Cast iron for use in boiler mountings, steam pipe fittings, side lugs, or any other parts of boilers where cast iron is permitted to be used, shall not have less than eighteen thousand (18,000) pounds tensile strength.

Cross pipes and cross boxes. 6. Cross pipes connecting the steam and water drums of water-tube boilers, and cross boxes, shall be of wrought or cast steel when the working pressure exceeds one hundred and sixty (160) pounds per square inch.

7. Mud drums of water-tube boilers shall be of wrought or cast steel when the working pressure exceeds one hundred and sixty (160) pounds per square inch. Mud drums.

8. Pressure parts of superheaters, attached to boilers or separately fired, shall be of wrought or cast steel when the working pressure exceeds fifty (50) pounds per square inch. Superheaters.

9. Boiler and superheater mountings, such as nozzles, cross pipes, steam pipes, fittings, valves and their bonnets shall be of wrought or cast steel when exposed to steam which is superheated over 80° Fahrenheit.

10. Waterleg and door frame rings of vertical fire-tube boilers thirty-six (36) inches or over in diameter, shall be of wrought or cast steel, or wrought iron. Leg and doorframe rings.

11. Waterleg and door frame rings of locomotive type boilers shall be wrought or cast steel, or wrought iron.

Section 3.

1. In laying out plates and heads in the boiler shop care shall be taken to leave at least one of the stamps, specified in paragraphs 18 and 19, section 1, Part III. of these Rules, so located as to be plainly visible when the boiler is completed. Stamps to be visible.

2. Each boiler shall conform in every detail with the Rules formulated by this Board, and shall be distinctly stamped by the builder with the words "Massachusetts Standard," abbreviated to read MASS. STD., also with a serial number and with the name of the builder, either in full or abbreviated; and the builder shall submit a fac-simile of his proposed style of stamping to this Board for approval. The height of letters and figures used in stamping shall not be less than one-fourth ($\frac{1}{4}$) inch. Boilers to be stamped.

3. In numbering serially each builder shall commence with the number one (1) and continue numbering in consecutive order. Serial numbers.

4. A data report, on forms to be furnished by the boiler inspection department of the district police, shall be forwarded by the builder to such department, for each boiler stamped by said builder as above specified. Data reports.

5. Location of stamps to be as follows: — Location of stamps.

(*a*) On Horizontal Return Tubular Boilers — on the front head above the central rows of tubes.

(*b*) On Horizontal Flue Boilers — on the front head above the flues.

(*c*) On Locomotive Type or Star Water Tube Boilers — on the furnace end above the handhole.

(*d*) On Vertical Fire and Vertical Submerged Tube Boilers — on the shell above the furnace door.

(*e*) On Water Tube Boilers, Babcock & Wilcox, Stirling, Heine, and Robb-Mumford Standard Types — on a head above the manhole opening, preferably on the flanging of the manhole opening.

(*f*) On Vertical Boilers, Climax or Hazelton Type — on the top head.

(*g*) On Cahall Vertical Water Tube Boilers — on the upper drum above the manhole opening.

(*h*) On Scotch Marine Boilers — on the front head above the center or right-hand furnace.

(*i*) On Economic Boilers — on the rear head above the central rows of tubes.

(*j*) For other types and new designs — in a location to be approved by this Board.

Stamps not to be covered.

6. The boiler builder's stamp shall not be covered by insulating or other material.

Construction inspection.

7. All boiler shops in which boilers are constructed for installation in this Commonwealth shall be open to the members of the boiler inspection department of the district police and inspectors holding certificates of competency as inspectors of steam boilers, as provided by section 6, chapter 465, Acts of 1907, at all reasonable hours, for inspection of material, methods of manufacture, workmanship and testing.

Section 4.

To determine maximum allowable pressure.

1. The maximum pressure to be allowed on a boiler constructed of steel or wrought-iron shells or drums shall be determined from the minimum thickness of the shell plates, the lowest tensile strength stamped on the plates by the plate manufacturer, the efficiency of the longitudinal joint or ligament between the tube holes, whichever is the least, the inside diameter of the outside course, and a factor of safety of not less than five (5); the formula being: —

$$\frac{\text{T. S.} \times \text{t} \times \%}{\text{R} \times \text{F. S.}} = \text{maximum allowable working pressure per square inch, in pounds.}$$

T. S. = tensile strength of shell plates in pounds.

t = minimum thickness of shell plates in inches.

% = efficiency of longitudinal joint or ligament between tube holes, whichever is the least.

R = radius = one-half ($\frac{1}{2}$) the inside diameter of the outside course of the shell or drum.

F. S. = 5, the lowest factor of safety allowed on boilers installed after May 1st, 1908.

NOTE. — The method of determining the efficiency of longitudinal joint is given in section 7 of Part II., and of determining the efficiency of ligament between tube holes in the following paragraphs.

2. Efficiency of Ligament: When a shell or drum is drilled for tube holes in a line parallel to the axis of the shell or drum, the efficiency of the ligament between the tube holes shall be determined as follows: —

Ligament between parallel tube holes.

(*a*) When the pitch of tube holes on every row is equal, the formula is:

$$\frac{p-d}{p} = \text{efficiency of ligament.}$$

p = pitch of tube holes in inches.
d = diameter of tube holes in inches.

Example. —

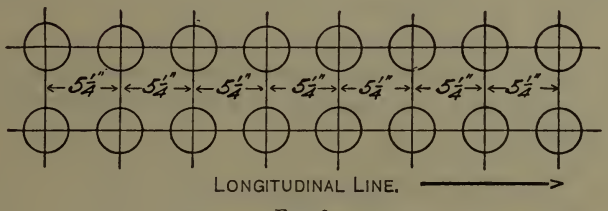


FIG. 9.

Pitch of tube holes in the drum of a water-tube boiler $= 5\frac{1}{4}'' = 5.25''$.
Diameter of tube holes $= 3\frac{1}{4}'' = 3.25''$.

$$\frac{p-d}{p} = \frac{5.25-3.25}{5.25} = .38, \text{ Efficiency of ligament.}$$

(*b*) When the pitch of tube holes on any one row is unequal, the formula is:

$$\frac{P-nd}{P} = \text{efficiency of ligament.}$$

P = unit length of ligament in inches.
n = number of tube holes in length, P.
d = diameter of tube holes in inches.

Example. —

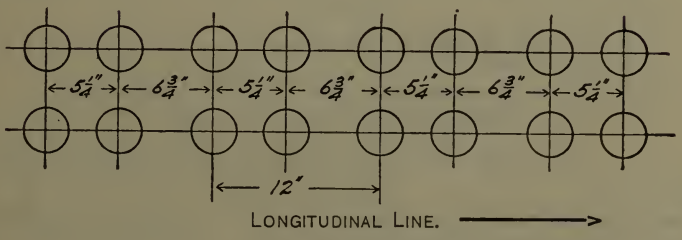


FIG. 10.

$$\frac{P-nd}{P} = \frac{12-2\times 3.25}{12} = .458, \text{ Efficiency of ligament.}$$

Example. —

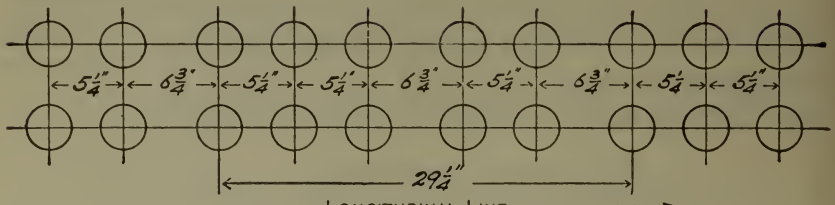


FIG. 11.

$$\frac{P-nd}{P}=\frac{29.25-5\times3.25}{29.25}=.444,$$ Efficiency of ligament.

Ligament between diagonal tube holes.

3. When a shell or drum is drilled for tube holes in a line diagonal with the axis of the shell or drum, the efficiency of the ligament between the tube holes shall be determined as follows: —

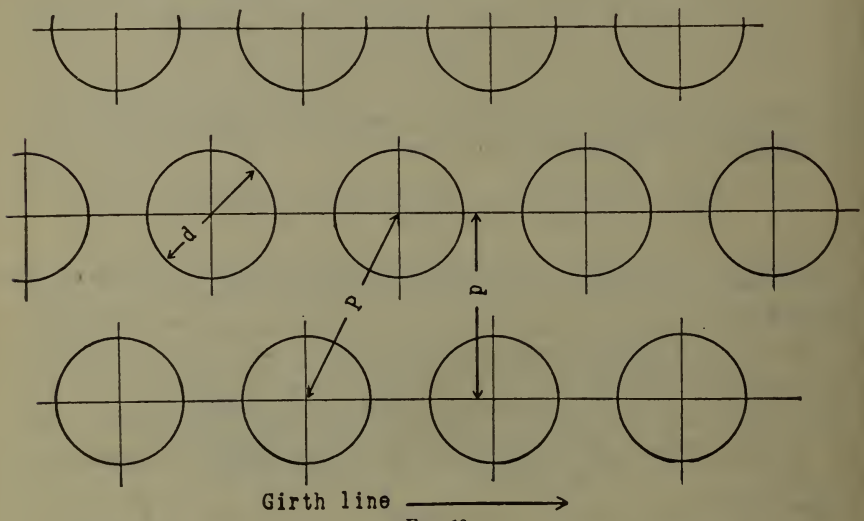


FIG. 12.

$\frac{P-d}{p}$ = efficiency of ligament.

P = diagonal pitch of tube holes in inches.

d = diameter of tube holes in inches.

p = distance between rows of tubes, longitudinally.

Example. —

Diagonal pitch of tube holes in the drum of a water tube boiler = 6.42″.

Diameter of tube holes = 4″.

Distance between rows of tubes, longitudinally = 5.75″.

$$\frac{6.42-4}{5.75}=.42,$$ Efficiency of ligament.

Staying heads by steel angles.

4. When the shell of a horizontal return tubular boiler does not exceed thirty-six (36) inches in diameter, and is designed for a maximum working pressure of one hundred (100) pounds per square inch, the segment of head above the tubes may be stayed by steel angles, or Tee bars; the formula being: —

$$\frac{f\,I}{y} = M.$$

f = fibre stress = 16,000 pounds.

I = moment of inertia = $\frac{b\,h^3}{12}$.

{ h = height of beam in inches. }
{ b = thickness of beam in inches. }

y = distance of most strained fibre = h ÷ 2.

M = bending moment of beam.

Maximum bending moment for uniform load = $\frac{W\,L}{8}$.

{ W = weight to be supported in pounds. }
{ L = length of beam in inches. }

Staying heads 30″ H. T. boiler.

5. When steel angles are used, the head of a horizontal return tubular boiler thirty (30) inches in diameter shall be stayed by two (2) four and one-half by three by three-eighths ($4\frac{1}{2} \times 3 \times \frac{3}{8}$) inch steel angles, or equivalent, as shown in Fig. 13.

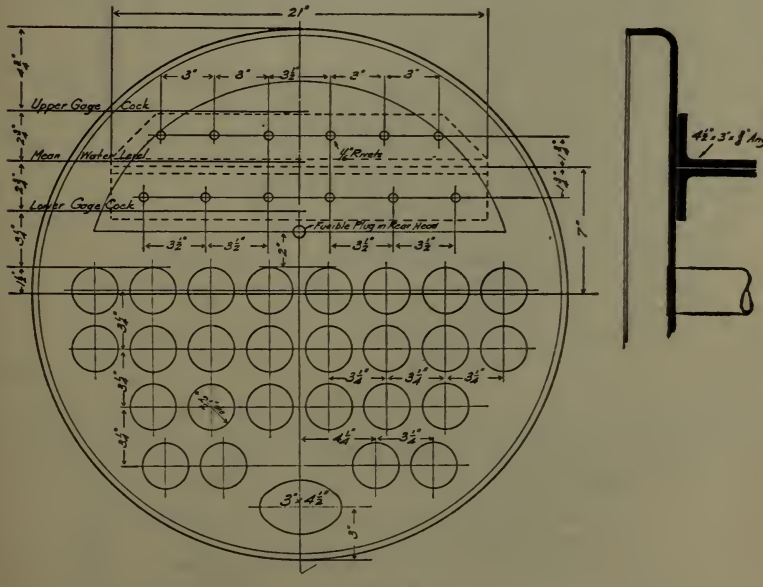


Fig. 13.

Distance from tubes to shell = $13\frac{1}{2}''$.
Area to be stayed = 143.5 square inches.
Load at 100 pounds pressure = 14,350 pounds.

$$\frac{W\ L}{8} = \frac{14{,}350 \times 21}{8} = 37{,}670 \text{ pounds.}$$

Moment of inertia = $I = \frac{1}{1\frac{1}{2}} \times 4.5^3 \times \frac{3}{8} = 2.85$.

$$y = 4.5 \div 2 = 2.25.$$

$$\frac{f\ I}{y} = M = \frac{16{,}000 \times 2.85}{2.25} = 20{,}266 \text{ pounds for one angle.}$$

Resistance of one angle = 20,266 pounds.
Resistance of two angles = 40,532 pounds.

Staying heads 36″ H. T. boiler.

6. When steel angles are used, the head of a horizontal return tubular boiler, thirty-six (36) inches in diameter, shall be stayed by two (2) six by three and one-half by one-half ($6 \times 3\frac{1}{2} \times \frac{1}{2}$) inch steel angles, or equivalent, as shown in Fig. 14.

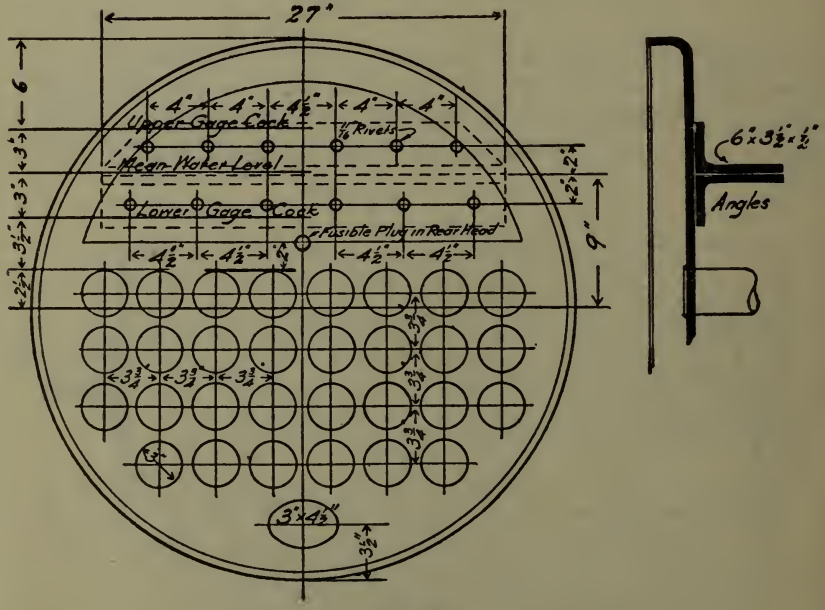


Fig. 14.

Distance from tubes to shell = $15\frac{1}{2}''$.
Area to be stayed = $220\frac{1}{2}$ square inches.
Load at 100 pounds pressure = 22,050 pounds.

$$\frac{W\ L}{8} = \frac{22{,}050 \times 27}{8} = 74{,}420 \text{ pounds.}$$

$$\text{Moment of inertia} = I = \tfrac{1}{12} \times 6^3 \times \tfrac{1}{2} = 9.$$

$$y = 6 \div 2 = 3.$$

$$\frac{f\,I}{y} = M = \frac{16{,}000 \times 9}{3} = 48{,}000 \text{ pounds for one angle.}$$

Resistance of one angle = 48,000 pounds.
Resistance of two angles = 96,000 pounds.

7. The longitudinal joints of a boiler, the shell or drum of which exceeds thirty-six (36) inches in diameter, shall be of butt and double strap construction. Longitudinal joints.

8. The longitudinal joints of a boiler, the shell or drum of which does not exceed thirty-six (36) inches in diameter, may be of lap-riveted construction; and the maximum pressure allowed on such shells or drums shall not exceed one hundred (100) pounds per square inch.

9. Any form of longitudinal joint, other than specified in paragraphs Nos. 7 and 8 of this section, shall be submitted to this Board for approval.

10. The longitudinal joints of horizontal return tubular boilers shall be located above the fire-line of the setting.

11. A horizontal return tubular, vertical tubular, or locomotive type boiler shall not have a continuous longitudinal joint over twelve (12) feet in length.

12. The thickness of plates in a shell or drum shall be of the same gage. Thickness of plates.

13. The minimum thickness of plates used in the construction of a boiler shall be one-fourth ($\frac{1}{4}$) inch. Thickness of shell plates.

14. The minimum thickness of shell plates shall be as follows: —

When the Diameter of Shell is —			
36″ or under.	Over 36″ to 54″ inclusive.	Over 54″ to 72″ inclusive.	Over 72″.
¼″	5/16″	3/8″	½″

This Board does not recommend the use of externally fired boilers over eighty-four (84) inches in diameter.

15. The minimum thickness of butt straps shall be as follows: — Thickness of butt straps.

Thickness of Shell Plates.	Minimum Thickness of Butt Straps.	Thickness of Shell Plates.	Minimum Thickness of Butt Straps.
¼″	¼″	7/16″	3/8″
9/32″	¼″	15/32″	13/32″
5/16″	9/32″	½″	7/16″
11/32″	9/32″	9/16″	7/16″
3/8″	5/16″	5/8″	½″
13/32″	11/32″		

16. Butt straps shall be rolled to the proper curvature on forms made for that purpose.

Thickness of heads.

17. The minimum thickness of heads and tube sheets shall be as follows: —

When the Diameter of Head or Tube Sheet is —			
42″ or under.	Over 42″ to 54″ inclusive.	Over 54″ to 72″ inclusive.	Over 72″.
$\frac{3}{8}$″	$\frac{7}{16}$″	$\frac{1}{2}$″	$\frac{9}{16}$″

Bumped heads.

18. The minimum thickness of a convex head shall be determined by the following formula: —

$$\frac{R \times F.\ S. \times P}{T.\ S.} = t.$$

The minimum thickness of a concave head shall be determined by the following formula: —

$$\frac{R \times F.\ S. \times P}{.6(T.\ S.)} = t.$$

R = one-half the radius to which the head is bumped.

F. S. = 5 = factor of safety.

P = working pressure in pounds per square inch, for which the boiler is designed.

T. S. = tensile strength in pounds per square inch, stamped on the head by the manufacturer.

t = thickness of head in inches.

19. When a convex or concave head has a manhole opening, the thickness as found by the formula in paragraph 18 of this section shall be increased by not less than one-eighth ($\frac{1}{8}$) inch.

20. When a convex or concave head has a manhole opening the flange shall be turned inward, and to a depth of not less than three (3) times the thickness of the head.

Stayed flat surfaces.

21. The minimum thickness of plates in stayed flat surface construction shall be five-sixteenths ($\frac{5}{16}$) inch.

Pitch of stay-bolts.

22. The pitch allowed for stay-bolts, ends riveted over, on a flat surface and on a vertical fire-tube boiler in which the diameter of the furnace is thirty-six (36) inches or over, and the longitudinal joint is of lap-riveted construction, shall not exceed that given in the following table: —

TABLE OF MAXIMUM ALLOWABLE PITCH, IN INCHES, OF SCREWED STAY-BOLTS, ENDS RIVETED OVER.

Pressure in Pounds per Square Inch.	Thickness of Plate.						
	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"
	Pitch of Stay-bolts in Inches.						
100,	5 7/16	6 3/16	6 15/16	7 11/16	8 1/2	–	–
110,	5 1/4	6	6 11/16	7 3/8	8 1/8	–	–
120,	5 1/8	5 3/4	6 7/16	7 1/8	7 13/16	8 1/2	–
125,	5	5 5/8	6 5/16	7	7 11/16	8 3/8	–
130,	4 15/16	5 9/16	6 3/16	6 7/8	7 9/16	8 1/4	–
140,	4 3/4	5 1/2	6	6 5/8	7 5/16	7 15/16	–
150,	4 11/16	5 1/4	5 7/8	6 7/16	7 1/16	7 11/16	8 5/16
160,	4 9/16	5 1/8	5 11/16	6 1/4	6 7/8	7 1/2	8
170,	4 1/2	5	5 9/16	6 1/8	6 11/16	7 1/4	7 7/8
180,	4 3/8	4 7/8	5 7/16	6	6 1/2	7 1/16	7 11/16
190,	4 5/16	4 13/16	5 5/16	5 7/8	6 3/8	6 15/16	7 1/2
200,	4 1/4	4 11/16	5 3/16	5 11/16	6 1/4	6 3/4	7 5/16
225,	4 1/16	4 1/2	5	5 7/16	5 15/16	6 7/16	6 15/16
250,	3 15/16	4 3/8	4 3/4	5 1/4	5 11/16	6 3/16	6 5/8
300,	3 3/4	4 1/16	4 1/2	4 7/8	5 5/16	5 11/16	6 1/8

When a pitch not exceeding eight and one-half ($8\frac{1}{2}$) inches is required and is not given in the table, the following formula shall be used: —

$$S = \sqrt{\frac{C \times (T+1)^2}{P}} + 6, \text{ or } P = \frac{C \times (T+1)^2}{S^2 - 6}$$

S = maximum pitch of stay-bolts in inches.
C = a constant = 66.
T = thickness of plate in *sixteenths* of an inch.
P = working pressure per square inch in pounds.

When hollow stay-bolts are used, having the hole one-half ($\frac{1}{2}$) inch in diameter or over, the maximum allowable pitch given in the above table may be increased by the mean diameter of the stay-bolt: —

$$\text{Mean diameter of stay-bolt} = \frac{\text{least outside diameter of stay-bolt} + \text{diameter of hole in stay-bolt}}{2}$$

Pitch of stay-bolts, V. T. boilers.

23. A vertical fire-tube boiler, in which the diameter of the furnace is less than thirty-six (36) inches and the longitudinal joint is of lap-riveted construction, shall have the furnace sheet supported by one row of stay-bolts, or more, the circumferential pitch not to exceed that given in the following table, and the minimum outside diameter of stay-bolts to be as given in tables, paragraph 24 of this section.

Thickness of Furnace Sheet.	Pressure in Pounds per Square Inch.							
	100	110	120	125	130	140	150	175
	Circumferential Pitch of Stay-Bolts in Inches, not to exceed—							
1/4"	4 3/4	4 9/16	4 7/16	4 3/8	4 5/16	4 1/4	4 1/8	3 7/8
5/16"	5 7/16	5 1/4	5 1/8	5	4 15/16	4 3/4	4 11/16	4 7/16

24. The longitudinal pitch between stay-bolts on the furnace sheet of a vertical fire-tube boiler, in which the diameter of the furnace is less than thirty-six (36) inches and the longitudinal joint is of lap-riveted construction, shall not exceed that given in the following tables, the formula being: —

$$L = \left(\frac{C \times t^2}{P\,d}\right)^2$$

L = longitudinal pitch of stay-bolts, or one-half the height of furnace when only one circumferential row of stay-bolts is required.
C = a constant = 110.
t = thickness of furnace sheet in *thirty-seconds* of an inch.
P = working pressure per square inch, in pounds.
d = external diameter of furnace in inches.

Diameter of furnace not exceeding 20″.	Pressure in Pounds per Square Inch.							
	100	110	120	125	130	140	150	175
	Longitudinal Pitch of Stay-bolts in Inches, not to exceed —							
Thickness of furnace sheet 1/4″.	12 3/8	10 1/4	8 9/16	7 13/16	7 1/4	6 5/16	5 7/16	4
	Diameter of stay-bolts over threads shall not be less than three-fourths (3/4) inch.							

Diameter of furnace not exceeding 26″.	Pressure in Pounds per Square Inch.							
	100	110	120	125	130	140	150	175
	Longitudinal Pitch of Stay-bolts in Inches, not to exceed —							
Thickness of furnace sheet 1/4″.	7 1/4	6	5 1/16	4 3/8	4 5/16	-	-	-
	Diameter of stay-bolts over threads shall not be less than three-fourths (3/4) inch.							
Thickness of furnace sheet 5/16″.	15 7/8	14 3/4	12 3/8	11 3/8	10 9/16	9	7 15/16	5 3/4
	Diameter of stay-bolts over threads shall not be less than seven-eighths (7/8) inch.							

Diameter of furnace not exceeding 32″.	Pressure in Pounds per Square Inch.					
	100	110	120	125	130	140
	Longitudinal Pitch of Stay-bolts in Inches, not to exceed —					
Thickness of furnace sheet 5/16″.	11 3/4	9 3/4	8 1/8	7 9/16	6 15/16	6
	Diameter of stay-bolts over threads shall not be less than seven-eighths (7/8) inch.					

Diameter of furnace up to 36″.	Pressure in Pounds per Square Inch.				
	100	110	120	125	130
	Longitudinal Pitch of Stay-bolts in Inches, not to exceed —				
Thickness of furnace sheet 5/16″.	9	7 11/16	6 1/2	5 15/16	5 1/2
	Diameter of stay-bolts over threads shall not be less than seven-eighths (7/8) inch.				

25. When a pitch of stay-bolts is required for a pressure higher than given in the tables, paragraph 24 of this section, the furnace sheet shall be stay-bolted as a flat surface, as shown in the table, paragraph 22 of this section.

Measurement of height of furnace, V. T. boilers.

26. In a vertical fire-tube boiler the height of furnace shall be measured from the centre of rivets at the bottom of the waterleg to the centre of rivets in lower tube sheet, and the pitch of stay-bolts shall be measured at the furnace sheet.

Longitudinal joint of furnace sheet, V.T. boilers.

27. When the longitudinal joint of the furnace sheet of a vertical fire-tube boiler is of lap-riveted construction, a stay-bolt in each row shall be located near the longitudinal joint, as shown in Fig. 15.

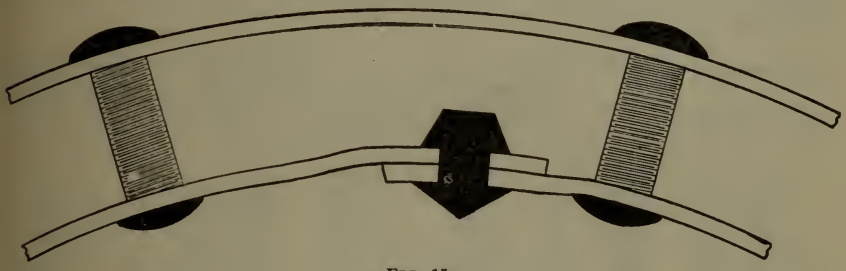


FIG. 15.

Stays and stay-bolts.

28. The maximum allowable strain per square inch net cross-sectional area of stays and stay-bolts shall be as follows:—

MATERIAL AND TYPE.	Size up to and including 1¼" Diameter or Equivalent.	Size over 1¼" Diameter or Equivalent.
Weldless mild steel, head to head or through stays,	8,000 lbs.	9,000 lbs.
Weldless mild steel, diagonal or crowfoot stays,	7,500 lbs.	8,000 lbs.
Wrought-iron weldless, head to head or through stays, ...	7,000 lbs.	7,500 lbs.
Wrought-iron weldless, diagonal or crowfoot stays	6,500 lbs.	7,000 lbs.
Mild steel or wrought-iron, welded stays, . .	6,000 lbs.	6,000 lbs.
Mild steel or wrought-iron, stay-bolts, . . .	6,500 lbs.	7,000 lbs.

Specifications for stays and stay-bolts, tested material.

29. When a greater allowable strain per square inch on stays and stay-bolts is required than that allowed in paragraph 28 of this section, the material shall conform to the following physical qualities:—

Tensile strength, pounds per square inch, shall not exceed, ...	62,000
Yield point in pounds per square inch shall not be less than, ...	½ T. S.
Elongation per cent. in eight inches shall not be less than, ...	28

and a certified report of test of such material shall be filed with the data report, required by paragraph 4, section 3, Part III. of these Rules; and the maximum allowable strain on such stays or stay-bolts shall be based on a factor of safety of not less than six and five-tenths (6.5).

Allowable load on stay-bolts.

30. A table of net cross-sectional area and allowable loads on stay-bolts, V threads, twelve (12) threads per inch, follows: —

Outside Diameter of Stay-bolts in Inches.	Diameter at Bottom of Thread in Inches.	Area at Bottom of Thread in Square Inches.	Load allowed at 6,500 Pounds per Square Inch.	Load allowed at 7,000 Pounds per Square Inch.
¾	.7500	.6057	.288	1,872	2,016
13/16	.8125	.6682	.351	2,282	2,457
⅞	.8750	.7307	.419	2,724	2,933
15/16	.9375	.7932	.494	3,211	3,458
1	1.0000	.8557	.575	3,738	4,025
1 1/16	1.0625	.9182	.662	4,303	4,634
1⅛	1.1250	.9807	.755	4,908	5,285
1 3/16	1.1875	1.0432	.855	5,558	5,985
1¼	1.2500	1.1057	.960	6,240	6,720
1 5/16	1.3125	1.1682	1.142	7,423	7,994
1⅜	1.3750	1.2307	1.190	7,735	8,330
1 7/16	1.4375	1.2932	1.313	8,535	9,191
1½	1.5000	1.3557	1.444	9,386	10,108

The formula for diameter of stay-bolt at bottom of thread being: —

$$D - (P \times 1.732) = d, \text{ or}$$
$$D - (.08333 \times 1.732) = d, \text{ then}$$
$$D - .1443 = d.$$

D = diameter of stay-bolt over the threads.
P = pitch of threads = $\frac{1}{12}$ = .08333.
d = diameter of stay-bolt at bottom of threads.
1.732 = a constant.

When U. S. threads are used, the formula becomes: —

$$D - (P \times 1.732 \times .75) = d.$$

Load allowed on stay-bolts.

31. To determine the maximum allowable working pressure per square inch on *stay-bolted* flat surface, or curved surface on furnace sheet thirty-six (36) inches in diameter or over: —

Divide the load in pounds allowed on a given stay-bolt by the net area supported by the stay-bolt in square inches: —

Example. —

Pitch of stay-bolts $= 5'' \times 5''$.

Outside diameter of stay-bolt $= \frac{7}{8}''$.

Area of a $\frac{7}{8}''$ stay-bolt at bottom of thread $= .419$ square inches.

Load allowed on a $\frac{7}{8}''$ stay-bolt at 6,500 pounds per square inch $= 2,724$ pounds.

Net area supported by one stay-bolt $= 5'' \times 5'' = 25 - .419$ (net area of stay-bolt) $= 24.581$ square inches.

$2,724 \div 24.581 = 110$ pounds, Maximum allowable pressure per square inch.

32. Table of allowable loads on net cross-sectional area of circular stays or rectangular stays of equal cross-sectional area.

Minimum Diameter of Circular Stay in Inches.		Net Cross-sectional Area of Stay in Square Inches.	Allowable Load in Pounds per Square Inch Net Cross-sectional Area.					
			6,000	6,500	7,000	7,500	8,000	9,000
			Allowable Load in Pounds on Net Cross-sectional Area.					
1	1.0000	.7854	4,712	5,105	5,498	5,891	6,283	–
1 1/16	1.0625	.8866	5,320	5,763	6,206	6,650	7,093	–
1 1/8	1.1250	.9940	5,964	6,461	6,958	7,455	7,952	–
1 3/16	1.1875	1.1075	6,645	7,199	7,753	8,306	8,860	–
1 1/4	1.2500	1.2272	7,363	7,977	8,590	9,204	9,818	–
1 5/16	1.3125	1.3530	8,118	8,795	9,471	10,148	10,824	12,177
1 3/8	1.3750	1.4849	8,909	9,652	10,394	11,137	11,879	13,364
1 7/16	1.4375	1.6230	9,738	10,550	11,361	12,173	12,984	14,607
1 1/2	1.5000	1.7671	10,603	11,486	12,370	13,253	14,137	15,904
1 9/16	1.5625	1.9175	11,505	12,464	13,423	14,381	15,340	17,258
1 5/8	1.6250	2.0739	12,443	13,480	14,517	15,554	16,591	18,665
1 11/16	1.6875	2.2365	13,419	14,537	15,655	16,744	17,892	20,129
1 3/4	1.7500	2.4053	14,432	15,634	16,837	18,040	19,242	21,648
1 13/16	1.8125	2.5802	15,481	16,771	18,061	19,352	20,642	23,222
1 7/8	1.8750	2.7612	16,567	17,948	19,328	20,709	22,090	24,851
1 15/16	1.9375	2.9483	17,690	19,164	20,638	22,112	23,586	26,535
2	2.0000	3.1416	18,850	20,420	21,991	23,562	25,133	28,274
2 1/8	2.1250	3.5466	21,280	23,053	24,826	26,600	28,373	31,919
2 1/4	2.2500	3.9761	23,857	25,845	27,833	29,821	31,809	35,785
2 3/8	2.3750	4.4301	26,580	28,796	31,011	33,226	35,441	39,871
2 1/2	2.5000	4.9087	29,452	31,907	34,361	36,815	39,270	44,178
2 5/8	2.6250	5.4119	32,471	35,177	37,883	40,589	43,295	48,707
2 3/4	2.7500	5.9396	35,638	38,607	41,577	44,547	47,517	53,456
2 7/8	2.8750	6.4918	38,951	42,197	45,443	48,689	51,934	58,426
3	3.0000	7.0686	42,412	45,946	49,480	53,015	56,549	63,617

33. The minimum thickness of cast-iron nozzles shall be determined by the following formula: — Cast-iron nozzles.

$$\frac{Pdf}{2S} + .5 = t.$$

P = working pressure in pounds per square inch.

d = inside diameter of nozzle in inches.

f = factor of safety = 12.

S = ultimate tensile strength of cast-iron, not less than eighteen thousand (18,000) pounds per square inch as required by paragraph 5, section 2, Part III. of these Rules.

.5 = a constant.

t = thickness of nozzle in inches.

Example. — Find the required thickness of a cast-iron steam nozzle six (6) inches in diameter for a working pressure of one hundred and fifty (150) pounds.

$$\frac{150 \times 6 \times 12}{2 \times 18{,}000} + .5 = .8'', \text{ Thickness of nozzle.}$$

Cast-iron flanges and blank flanges.

34. When the pressure allowed on a boiler exceeds one hundred and thirty-five (135) pounds per square inch, the thickness of the flanges of cast-iron nozzles, and of cast-iron blank flanges, shall not be less than specified by the manufacturers' standard for high pressure.

Riveting.

35. The distance from the centre of rivet hole to the edge of the plate shall not be less than one and one-half ($1\frac{1}{2}$) times the diameter of the rivet hole. This provides against the failure of a joint through crushing of the plate in front of the rivets.

36. Rivet holes shall be drilled full size with plates, butt straps and heads bolted up in position; or they may be punched at least one-fourth ($\frac{1}{4}$) inch less than full size, and then drilled to full size, with plates, butt straps and heads bolted up in position. In either case the parts shall be separated and all burrs removed, after the rivet holes are finished.

37. Rivets shall be of sufficient length to completely fill the rivet holes and form a head equal in strength to the body of the rivet.

38. Rivets shall be machine driven, wherever possible, with sufficient pressure to fill the rivet holes, and shall be allowed to cool and shrink under pressure.

Calking.

39. The calking edges of plates and heads shall be beveled wherever possible. Calking shall be done with a round-nosed tool.

Tube holes.

40. Tube holes shall be drilled full size, or the center punched out not to exceed one (1) inch in diameter and finished up full size with rotating cutter.

41. The edges of tube holes shall be chamfered to a radius of about one-sixteenth ($\frac{1}{16}$) inch.

Tube ends fire-tube boilers.

42. A fire-tube boiler shall have the ends of the tubes substantially beaded.

Tube ends water-tube boilers and superheaters.

43. The ends of all tubes, suspension tubes and nipples shall be flared not less than one-eighth ($\frac{1}{8}$) inch over the diameter of the tube hole on all water-tube boilers and superheaters.

44. The ends of all tubes, suspension tubes and nipples of water-tube boilers and superheaters shall not project through the tube sheets or headers less than one-fourth ($\frac{1}{4}$) inch nor more than one-half ($\frac{1}{2}$) inch. Separately fired superheaters shall have the tube ends protected by refractory material where they connect with drums or headers.

Fusible plug in a tube.

45. When it is necessary to place a fusible plug in a tube, an extra thick tube shall be provided for that purpose.

Openings in shells, drums or heads to be re-enforced.

46. An opening in a shell, drum or head for a pipe connection over one (1) inch in diameter (except water column connections, or feed-pipe connections where brass or steel boiler bushing or its equivalent shall be used) shall not have less than the minimum number of threads in such opening, as shown in the table given in paragraph 6, section 5, Part III. of these Rules; and if the thickness of the shell, drum or head is not sufficient to give such number of threads there shall be a standard commercial pressed steel flange or steel plate, substantially riveted to the shell, drum or head, so as to give the required number of threads. Main steam and safety valve openings may be fitted with either cast steel or cast-iron nozzles. [*Approved June 9, 1908.*

Manholes and sizes.

47. The standard manhole shall be an ellipse of the following sizes: —

Eleven by fifteen (11 x 15) inches.

Twelve by sixteen (12 x 16) inches. [Amended Oct. 2, 1908, see p. 126.

48. There shall be a standard sized manhole in the upper part of the shell or head of a fire-tube boiler over thirty-six (36) inches in diameter, except vertical fire-tube boilers.

49. A manhole frame shall be of wrought or cast steel, and have a net cross-sectional area, on a line parallel to the axis of the shell, not less than the cross-sectional area of shell plate removed on the same line.

50. The strength of manhole plates, yokes and bolts shall be in proportion to the strength of the manhole frames.

Manhole plates shall be of wrought or cast steel.

Manhole frames on shells or drums shall have the proper curvature, and on boilers over forty-eight (48) inches in diameter shall be double-riveted to the shell or drum.

Handholes and sizes.

51. The standard handhole (see Fig. 16) shall be an ellipse of the following sizes: —

Two and one-fourth by three and one-fourth ($2\frac{1}{4}$ x $3\frac{1}{4}$) inches.

Two and five-eighths by three and three-fourths ($2\frac{5}{8}$ x $3\frac{3}{4}$) inches.

Three by four and one-half (3 x $4\frac{1}{2}$) inches.

Three and one-half by five ($3\frac{1}{2}$ x 5) inches.

Four by six (4 x 6) inches. [Amended Oct. 2, 1908, see page 126.

Location of manholes and handholes.

52. A standard sized manhole shall be located in the front head, below the tubes, of a horizontal return tubular boiler sixty (60) inches or over in diameter.

53. A standard sized manhole or handhole shall be located in the front head, below the tubes, of a horizontal return tubular boiler less than sixty (60) inches in diameter.

54. A standard sized handhole shall be located in the rear head of a horizontal return tubular boiler, below the tubes, except one which has a standard sized manhole in the front head, below the tubes.

55. A locomotive type boiler shall not have less than six (6) standard sized handholes, located as follows: —

One (1) in the rear head below the tubes.

One (1) in the front head at or about the line of the crown sheet.

Four (4) in the lower part of the waterleg.

Also, where possible, one (1) near the throat sheet.

56. A vertical fire-tube boiler, except the boiler of a steam fire-engine, shall have not less than four (4) standard sized handholes, located as follows: —

One (1) in the shell at or about the line of the crown sheet.

One (1) in the shell at or about the line of the fusible plug, except a vertical fire-tube boiler having a manhole in the shell or head, through which the fusible plug is accessible.

Two (2) in the shell at the lower part of the waterleg.

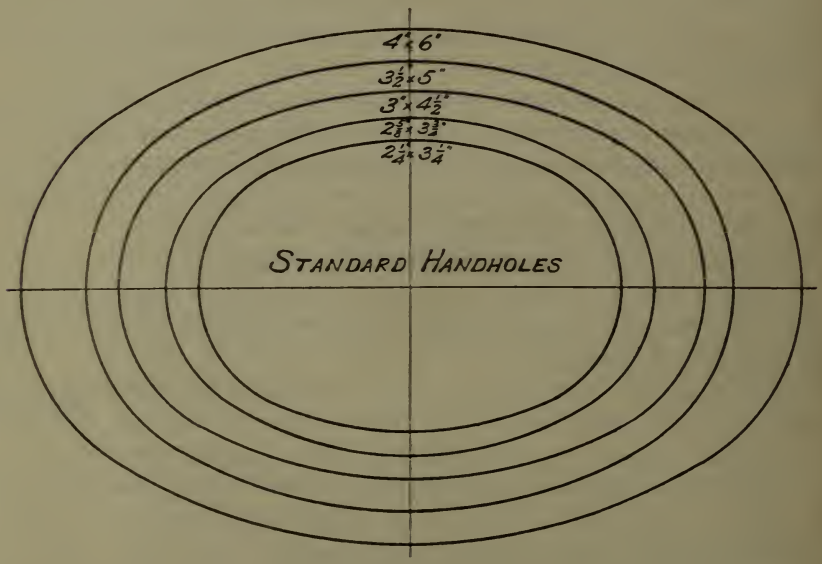


FIG. 16.

57. A vertical fire-tube boiler of a steam fire-engine shall not have less than three (3) brass washout plugs of not less than one (1) inch pipe size, screwed into the shell and located as follows: —

One (1) at or about the line of the crown sheet.

Two (2) at the lower part of the waterleg.

58. There shall not be less than one and one-half (1½) inches of solid plate around a handhole opening in a shell, drum or head of a boiler. [Amended Oct. 2, 1908, see page 127.

Method of supporting H. T. boilers.

59. A horizontal return tubular boiler over seventy-eight (78) inches in diameter shall be supported from steel lugs by the outside suspended type of setting; where three (3) supports are necessary on each side of a boiler an equalizer shall be used.

60. A horizontal return tubular boiler over fifty-four (54) inches in diameter, and up to and including seventy-eight (78) inches in diameter, shall be supported by the outside suspended type of setting, or by not less than four (4) steel or cast-iron brackets on each side, set in pairs.

61. A horizontal return tubular boiler up to and including fifty-four (54) inches in diameter shall be supported by the outside suspended type of setting, or by not less than two (2) steel or cast-iron brackets on each side.

Supporting lugs or brackets.

62. Supporting lugs or brackets shall have the proper curvature and be securely riveted to the shell; the shearing stress on the rivets not to exceed eight (8) per cent. of the allowable shearing strength given in paragraph 5, section 1, Part II. of these Rules.

Height of grate.

63. The upper surface of the fire-grate of an internally fired boiler of the open bottom locomotive, vertical fire-tube or similar type shall not be less than two (2) inches above the row of rivets at the lower end of the furnace.

Wet bottom boilers.

64. Wet bottom boilers shall have a clear space of not less than twelve (12) inches between the bottom of the boiler and the floor line.

This Board does not recommend a steam dome on a boiler, and recommends the use of a dry pipe located at the highest point of the steam space, with closed ends and small slotted or drilled openings on its upper part, having a total area not less than twice the area of the outlet, and having an ample drain opening at the lowest point.

Section 5.

Safety valves on steam pipes.

1. A safety valve shall not be connected to an internal pipe placed in the steam space of a boiler.

2. When boilers have their safety valves set at different pressures, and are connected to a common steam main, the boilers allowed the lowest pressure shall each be protected by a safety valve or valves placed on the connecting pipe to the steam main. The area or combined area of the safety valves shall not be less than the area of the connecting pipe.

Safety valves on superheaters.

3. When a superheater can be shut off from the boiler, whether attached or separately fired, it shall have an ample safety valve at or near the steam inlet.

Stop valves.

4. All steam outlets from a boiler which are two (2) inches in diameter or over (except safety valve connections) shall be fitted with a stop valve of the outside screw and yoke type.

5. When boilers on which the allowable pressure exceeds one hundred and thirty-five (135) pounds are set in battery, the main steam pipe shall have two (2) stop valves of the outside screw and yoke type, with an ample valved drain between them having an open discharge. The fittings from boiler up to and including the valves shall be extra heavy, made to the manufacturers' standard for high pressures, and the pipe from the boiler up to the first stop valve shall also be extra heavy.

This Board does not recommend the use of cast-iron or copper steam pipe.

Pipe threads.

6. The minimum number of threads that a pipe or nipple shall screw into a fitting is given in the following table: —

Size of pipe in inches, ...	1 to 2 inclusive.	2½ to 4.	4½ to 6.	7 and 8.	9 and 10.	12
Number of threads per inch. . . .	11½	8	8	8	8	8
Minimum number of threads into fitting,	5	7	8	10	12	13

7. All boilers set in battery and superheating the steam they generate over 80° Fahrenheit shall have two (2) stop valves, with an ample valved drain between them having an open discharge.

Feed piping.

8. The feed pipe of a boiler shall be of brass from the check valve to the discharge end, and shall have open end or ends.

9. The feed water shall discharge about three-fifths ($\frac{3}{5}$) the length of a horizontal return tubular boiler from the front head (except a horizontal return tubular boiler equipped with an auxiliary feed water heating and circulating device), and at or about the central rows of tubes above the tubes, when the diameter of the boiler exceeds thirty-six (36) inches and the pressure allowed exceeds twenty-five (25) pounds per square inch. The feed pipe shall be carried through the head or shell with a brass or steel boiler bushing, and securely fastened inside the shell above the tubes.

Feed-water discharge.

10. Feed water shall not discharge in a boiler in close proximity to riveted joints in shell or furnace sheets.

Valves on feed piping.

11. When boilers of fifty (50) horse-power or over are set in battery, each boiler shall have two (2) stop valves, or a stop valve and stop cock, on the feed pipe, one (1) on each side of the check valve.

Feed-water appliances.

12. When a boiler of over fifty (50) horse-power has a pump, inspirator or injector as the primary means of supplying feed water when the maximum pressure allowed is carried, more than one such mechanical appliance shall be provided. [Amended Oct. 2, 1908, see p. 127.

Temperature of feed.

13. The temperature of the usual feed water entering a boiler, except the boiler of a steam fire-engine, shall not be less than 120° Fahrenheit when the pressure allowed exceeds twenty-five (25) pounds per square inch.

Surface blow-off.

14. The maximum size of a surface blow-off pipe shall not exceed one and one-half (1½) inches, and it shall be carried through the shell or head with a brass or steel boiler bushing.

Bottom blow-off and fittings.

15. A bottom blow-off pipe shall be fitted with a valve or cock; the minimum size of pipe and fittings shall be one (1) inch and the maximum size shall be two and one-half (2½) inches. Globe valves shall not be used. [Amended Oct. 2, 1908, see page 127.

16. A bottom blow-off cock shall have the plug held in place by a guard or gland. The end of the plug shall be distinctly marked in line with its passage, and a handle shall be securely attached to the plug in line with the mark on the end of the plug.

17. When the pressure allowed on a boiler exceeds twenty-five (25) pounds per square inch, the bottom blow-off pipe and fittings, from the boiler to the valve or valves, shall be extra heavy.

18. When the pressure allowed on a boiler exceeds one hundred and thirty-five (135) pounds per square inch, the bottom blow-off pipe shall have two (2) valves, or a valve and a cock; and such valves, or valve and cock, shall be extra heavy.

19. When a bottom blow-off pipe is exposed to the products of combustion, it shall be protected by a substantial cast-iron removable sleeve or equivalent covering of non-conducting material.

20. An opening in brickwork for a blow-off pipe shall be fitted with an ample cast or wrought-iron sleeve, to provide for free expansion and contraction.

Clean-out doors.

21. The minimum size of a clean-out door to be placed in a boiler setting shall be twelve by sixteen (12 x 16) inches, or equivalent area, twelve (12) inches to be the least dimension in any case.

Water column pipes.

22. The minimum size of pipes connecting the water column of a boiler shall be one (1) inch.

23. The water connection to the water column of a boiler shall be of brass when the allowable pressure exceeds twenty-five (25) pounds per square inch.

24. The steam connection to the water column of a horizontal return tubular boiler shall be taken from the top of shell or the upper part of head;

the water connection shall be taken from a point not less than six (6) inches below the center line of the shell.

25. No connections, except for damper regulator, drains or steam gages, shall be placed on the pipes connecting the water column to the boiler.

26. When shut-off valves are placed on the pipes connecting a water column to a boiler, these valves shall be of the straight-way outside screw and yoke type, and shall be locked or sealed *open*.

27. No water glass connection shall be fitted with an automatic shut-off valve.

Steam mains.

28. Provision shall be made for the expansion and contraction of steam mains connected to all boilers, with substantial anchorage at suitable points, that there may be no perceptible vibration on the boiler shell plates.

29. Steam reservoirs shall be used on steam mains when heavy pulsations of the steam currents cause vibration on the boiler shell plates.

Superheater drains.

30. All superheaters shall be fitted with drains from headers or drums where water of condensation can collect.

Cast-iron sections.

31. The sections for a cast-iron boiler shall be tested by hydrostatic pressure to not less than sixty (60) pounds per square inch before being assembled.

[*Approved March 24th, 1908.*

Section 6.

1. When the owner of a boiler which does not conform in every detail with the rules of construction formulated by this Board desires to install or relocate such boiler in this Commonwealth, he shall have the boiler inspected by two (2) members of the boiler inspection department of the district police; or, provided the boiler is under the periodically guaranteed inspection of an insurance company authorized to insure boilers in this Commonwealth, the inspection may be made by a member of the boiler inspection department of the district police and an inspector holding a certificate of competency as an inspector of steam boilers, as provided by section 6, chapter 465, Acts of 1907, and employed by the company insuring the boiler; a joint inspection to be made by the two inspectors in either case. Such inspectors shall forward to this Board a report of their joint inspection on a form to be furnished by this Board, and the boiler may be installed or relocated only upon the receipt of the written approval of this Board, which shall be forwarded to both the owner and the boiler inspection department of the district police.

If such boiler is not installed or relocated within twelve (12) months from the date of approval, such approval shall be null and void. The longitudinal joints of such boiler must be in accord with the provisions of paragraphs 7, 8 and 9, section 4, Part III. of these Rules. [Amended Oct. 2, 1908, see page 127.

All rules and parts of rules inconsistent herewith are hereby repealed.

JOSEPH H. McNEILL.
JOHN A. STEVENS.
FREDERIC H. KEYES.
ROBERT J. DUNKLE.
WILLIAM M. BECK.

Approved:

EBEN S. DRAPER,
Lieut.-Governor, Acting Governor.

JUNE 9th, 1908.

AMENDMENTS TO RULES

Formulated by the Board of Boiler Rules

[In Accordance with the Provisions of Section 26, Chapter 465, Acts of 1907, "An Act relative to the Operation and Inspection of Steam Boilers."]

Paragraph forty-seven (page 119), section four, part three, of the Rules is hereby amended to read as follows: —

47. The standard manhole shall be an ellipse of the following sizes: —

Eleven by fifteen (11 x 15) inches.

Twelve by sixteen (12 x 16) inches.

A variation of one-half ($\frac{1}{2}$) inch in the above dimensions will be allowed.

Paragraph fifty-one (page 119), section four, part three, of the Rules is hereby amended to read as follows: —

51. The standard handhole (see Fig. 16) shall be an ellipse of the following sizes: —

Two and one-fourth by three and one-fourth ($2\frac{1}{4}$ x $3\frac{1}{4}$) inches.

Two and five-eighths by three and three-fourths ($2\frac{5}{8}$ x $3\frac{3}{4}$) inches.

Three by four and one-half (3 x $4\frac{1}{2}$) inches.

Three and one-half by five ($3\frac{1}{2}$ x 5) inches.

Four by six (4 x 6) inches.

A variation of one-fourth ($\frac{1}{4}$) inch in the above dimensions will be allowed.

Paragraph fifty-eight (page 121), section four, part three, of the Rules is hereby amended to read as follows: —

58. There shall not be less than one (1) inch of solid plate in the clear, inside and out, around a handhole opening in a shell, drum or head of a boiler.

Paragraph twelve (page 123), section five, part three, of the Rules is hereby amended to read as follows: —

12. When a pump, inspirator or injector is required to supply feed water to a boiler of over fifty (50) horse power, more than one such mechanical appliance shall be provided.

Paragraph fifteen (page 123), section five, part three, of the Rules is hereby amended to read as follows: —

15. Each boiler shall have a bottom blow-off pipe, fitted with a valve or cock, in direct connection with the lowest water space practicable; the minimum size of pipe and fittings shall be one (1) inch and the maximum size shall be two and one-half ($2\frac{1}{2}$) inches. Globe valves shall not be used.

Paragraph one (page 124), section six, part three, of the Rules is hereby amended to read as follows: —

Joint inspection.

1. When the owner of a boiler, except a portable boiler as provided in paragraph 2 of this section, which does not conform in every detail with the rules of construction formulated by this Board desires to install or relocate such boiler in this Commonwealth, he shall have the boiler inspected by two (2) members of the boiler inspection department of the district police; or, provided the boiler is under the periodically guaranteed inspection of an insurance company authorized to insure boilers in this Commonwealth, the inspection may be made by a member of the boiler inspection department of the district police and an inspector holding a certificate of competency as an inspector of steam boilers, as provided by section 6, chapter 465, Acts of 1907, and employed by the Company insuring the boiler; a joint inspection to be made by the two inspectors in either case. Such inspectors shall forward to this Board a report of their joint inspection on a form to be furnished by this Board, and the boiler may be installed or relocated only upon the receipt of the written approval of this Board, which shall be forwarded to both the owner and the boiler inspection department of the district police. If such boiler is not installed or relocated within twelve (12) months from the date of approval, such approval shall be null and void. The longitudinal joints of such boiler must be in accord with the provisions of paragraphs 7, 8 and 9, section 4, Part III. of these Rules.

ADDITIONAL RULES

PART III

Section 6

Portable boilers.

2. A portable boiler which has been used in this Commonwealth and removed therefrom, which does not conform in every detail with the rules of construction formulated by this Board, and has been previously inspected by a member of the boiler inspection department of the district police, or by an inspector of an insurance company authorized to insure steam boilers in this Commonwealth, may be inspected and a certificate of inspection issued if relocated in this Commonwealth.

Paragraphs 3, 4, 5 and 6 of this section shall apply to boilers constructed after April first, nineteen hundred and nine.

Staying flat-heads.

3. The area of a flat-head to be stayed shall be the area enclosed by lines drawn three (3) inches from the shell and two (2) inches from the tubes, as shown in Figures 1 and 17 of these Rules.

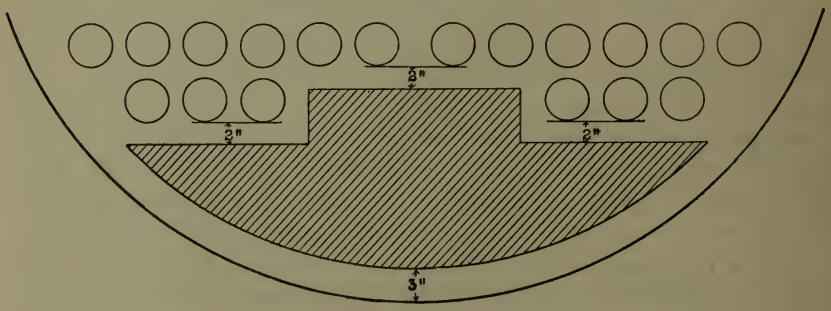


Fig. 17

4. When a flat-head has a manhole opening, the flange of which is formed from the solid sheet and turned inward to a depth of not less than twice the thickness of the head, an area two (2) inches wide all around the manhole opening, as shown in Fig. 18, may be deducted from the total area of head, including manhole opening, to be stayed:

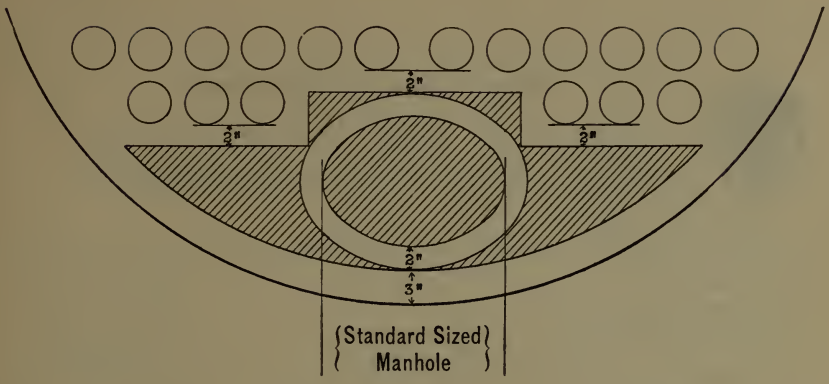


Fig. 18

Example: —

To find an area 2″ wide all around a 11″ x 15″ manhole,

15″ x 19″ x .7854 = 224 (nearly) square inches.
11″ x 15″ x .7854 = 130 (nearly) square inches.

And 224 — 130 = 94 square inches.

Therefore, if the area to be stayed on the *rear* head, below the tubes, of a seventy-two (72) inch horizontal return tubular boiler is 374 square inches, the area to be stayed on the *front* head, below the tubes, of this boiler, would be 374 — 94 = 280 square inches.

5. A horizontal return tubular boiler, having a manhole below the tubes, shall have one or more stays on each side of the manhole, the ends of which shall be attached to the front and rear heads of the boiler, and the center line of such stays shall not be below the center line of the manhole.

This Board does not recommend attaching diagonal stays to shell plates that are exposed to the products of combustion.

6. Head to head stays screwed through the sheets and riveted over shall not be used.

All rules and parts of rules inconsistent herewith are hereby repealed.

Joseph H. McNeill.
John A. Stevens.
Frederic H. Keyes.
Robert J. Dunkle.
William M. Beck.

Approved:

CURTIS GUILD, Jr.,
Governor.

October 1, 1908.

Commonwealth of Massachusetts.

DISTRICT POLICE. BOILER INSPECTION DEPARTMENT.

Manufacturers' Data Report of Boiler, as required by the provisions of the Rules formulated by the Board of Boiler Rules on the construction of steam boilers.

FORM 144.

1. Boiler manufactured by _____ at _____
2. Boiler manufactured for _____ of _____
3. Type of boiler _____ Serial No. _____
4. Shell plates and butt straps made by _____
5. (*a.*) Mill test report on shell plates: _____ (Tensile Strength. Lbs. per sq. in.) Yield point _____ (Lbs. per sq. in.)
   (*b.*) Elongation _____ (In 8 inches.) %. Phos. 0. _____ %. Sul. 0. _____ %. Man. 0. to 0. _____ %.
6. Mill test report on butt straps _____ (Brand and tensile strength.) Thickness _____ in.
7. Stamps on shell plates _____ (Brand and tensile strength.) Thickness _____ in.
8. Furnace sheets made by _____ Stamped _____ (Brand and tensile strength.) Thickness _____ in.
9. Heads made by _____ Stamped _____ (Brand and tensile strength.) Thickness _____ in.
10. Rivets made by _____ Material _____
11. Stays made by _____ Material _____
12. Channel or angle irons on heads _____ (No. and size on each head.) Upper tubes to shell _____ in. (H. T. Loco. or Scotch type.)
13. (*a.*) Stays above tubes _____ [No. each head, and type (through, head to head, or diagonal, welded or weldless) and net cross-sectional area of each size of each type.]
    (*b.*) _____ Area to be stayed _____ sq. in. (Each head above tubes.)
    (*c.*) Stays below tubes _____ [No. each head, and type (through, head to head, or diagonal, welded or weldless) and net cross-sectional area of each size of each type.]
    (*d.*) _____ Area to be stayed _____ sq. in. (Each head below tubes.)
14. (*a.*) Stay bolts: — Made by _____ Material _____ Size _____ sq. in. (Area at bottom of thread.)
    (*b.*) Maximum pitch of _____ in. (Circumferential (or Horizontal) X Vertical.) × _____ in. No. of rows _____ Headers W. T. boiler _____ (V. T. boiler only.) (Steel or cast-iron.)
15. Shell or drums: — Diam. _____ (All Boilers.) in. Length over all _____ (All Boilers.) ft. _____ in. No. of drums _____ (W. T. Boilers only.)
16. (*a.*) Longitudinal joints: — Type of _____ Riveting _____ (Double, triple, quad., etc.)
    (*b.*) Diam. rivet holes _____ in. Pitch of rivets _____ ′ × _____ ″ × _____ ″ (Minimum pitch on each row.) Efficiency of joint _____ %.
17. Girth joints _____ (Single or double riveted.) Diam. rivet holes _____ in. Pitch of rivets _____ in. No. of courses _____.
18. Tubes: — No. _____ (All boilers.) Diam. _____ (All boilers.) in. Length _____ (Fire tube boilers only.) ft. _____ in.
19. (*a.*) Furnaces, Scotch type boiler: — No. _____ Type _____ (Corrugated, Adamson ring, etc.)
    (*b.*) Thickness _____ in. Length _____ ft. _____ in. Mean diam. _____ in.
20. Steam outlets: — No. _____ Material _____ (Cast steel or cast-iron, pressed steel or steel plate.) Sizes _____ in.
21. Grate area _____ (Internally fired boiler.) sq. ft. Height of furnace, V.T. boiler _____ ft. _____ in. (See para. 26, sect. 4, Part III. of the rules.) Int. diam. of furnace _____ in. (V. T. Boiler only.)
22. Size feed inlet _____ in. Size bottom blow-off _____ in. Style of support _____ (See paras. 50, 60, 61, sect. 4, Part III. of the rules.)
23. Constructed for a pressure of _____ lbs. per sq. in. Tested to _____ (Hydrostatic pressure. See para. 1, sect. 6, Part II, of the rules.) lbs. per sq. in.
24. If B. &W. cross-drum, Climax, Hazelton, Stirling, Worthington or similar type, sketch of tube lay-out must accompany this report.
25. If boiler has a dome, send working drawing of dome, also showing connection to boiler and openings in shell under dome.

REMARKS: — _____

We certify the above data to be correct and that all details of MATERIAL, CONSTRUCTION and WORKMANSHIP on this boiler to conform to the Rules formulated by the Board of Boiler Rules.

_____ 19

(Signed) _____ (Manufacturer.)

by _____

Received _____ 19 Checked _____ 19 by _____

Rules allow a max. pressure of _____ lbs., this being based on _____ *Inspector.*

NOTE. — The standard size of this report is 8½ by 11 inches.

General Summary of Boiler Inspections.

Inspectors.	District.	Total Number of Boilers inspected.	Boilers inspected internally.	Boilers inspected externally.	Defects found.	Dangerous Defects found.	Boilers ordered repaired.	Boilers condemned.	Number of Boilers on which Pressure was reduced.
Baxter, Sturgis C.,	3, 9	141	132	9	308	213	123	–	7
Bushek, Henry,	1	337	283	54	1,379	1,055	314	13	33
DeShazo, James B.,	5	247	217	30	839	266	171	5	36
Dyer, David H.,	6	68	63	5	606	339	64	2	4
Evans, J. Walter,	9	225	201	24	586	108	195	1	48
Ferguson, Charles,	1	132	112	20	314	162	41	–	15
Forbush, Franklin L.,	9	245	164	81	973	340	197	–	19
Hinckley, Frank C. (special duty),	–	34	32	2	120	44	30	–	3
Kazar, John H.,	2, 3	3	2	1	1	–	1	–	–
Lovering, Arthur F.,	7, 8	212	139	73	907	134	201	3	46
Luck, George A.,	2	221	178	43	596	229	224	1	6
Mackintosh, George D.,	9	63	45	18	263	35	51	–	–
MacRae, John A.,	8	207	143	64	724	165	204	5	62
McCarthy, Justin H.,	7	44	16	28	172	157	44	–	–
McGrath, John,	9	148	134	14	447	331	121	1	17
Moran, Edward,	2	156	153	3	703	233	27	3	15
Morton, Harry E.,	2	211	188	23	731	404	178	2	27
Ramsay, William W.,	5	355	286	69	1,616	647	321	7	60
Sanborn, Freeman H.,	7	158	116	42	438	72	125	3	15
Simm, Wilbert E.,	4	149	134	15	626	95	119	–	29
Sullivan, Herbert A.,	4, 6	342	258	84	1,717	896	304	2	61
Totals,	–	3,698	2,996	702	14,066	5,925	3,055	48	503

General Summary of Examinations.

Inspectors.	District.	Applications received.	First-class Engineers.	Second-class Engineers.	Third-class Engineers.	Fourth-class Engineers.	First-class Firemen.	Second-class Firemen.	Specials, to have Charge.	Specials, to operate.	Total Licenses granted.	Applicants rejected.	Licenses renewed.	Licenses revoked.	Complaints investigated.	Prosecutions.	Fines paid.
Baxter, Sturgis C.,	3, 9	574	11	23	66	14	29	157	20	7	327	236	561	-	14	1	$10
Bushek, Henry,	1	303	2	5	17	8	12	66	29	5	144	153	213	3	140	1	-
DeShazo, James B.,	5	510	14	24	36	11	44	184	30	12	355	133	452	5	59	1	-
Dyer, David H.,	6	332	22	18	34	19	50	85	4	9	241	88	307	-	17	-	-
Evans, J. Walter,	9	293	5	8	14	45	13	66	12	5	168	143	200	2	45	-	-
Ferguson, Charles,	1	289	3	7	31	5	30	43	22	1	142	157	159	1	17	-	-
Forbush, Franklin L.,	9	229	2	5	20	6	38	61	6	4	142	100	459	1	29	-	-
Hinckley, Frank C. (special duty),	-	69	-	3	7	1	2	6	3	4	26	38	202	4	15	-	-
Kazar, John H.,	2, 3	444	7	15	60	10	34	143	18	8	295	140	182	-	78	-	-
Lovering, Arthur F.,	7, 8	306	4	9	45	23	54	72	5	9	221	84	93	-	10	-	-
Luck, George A.,	2	457	2	8	32	7	41	97	28	6	221	215	409	6	28	1	10
Mackintosh, George D.,	9	80	-	1	2	1	4	7	2	1	18	65	75	1	8	-	-
MacRae, John A.,	8	345	5	21	44	42	76	96	12	15	311	93	176	9	62	2	-
McCarthy, Justin H.,	7	100	1	3	10	4	24	20	2	8	72	25	29	-	20	-	-
McGrath, John,	9	483	10	31	56	8	26	112	29	9	281	210	525	1	28	-	-
Moran, Edward,	2	249	2	6	19	4	17	82	11	5	146	110	274	1	44	-	-
Morton, Harry E.,	2	130	-	4	13	6	14	30	4	5	76	52	249	3	10	1	10
Ramsay, William W.,	5	534	7	17	42	28	48	118	53	15	328	221	360	6	58	1	10
Sanborn, Freeman H.,	7	494	8	33	70	39	79	137	12	15	393	100	322	-	107	1	-
Simm, Wilbert E.,	4	337	3	2	17	8	17	68	15	2	132	195	336	1	51	-	-
Sullivan, Herbert A.,	4, 6	520	10	14	28	15	17	114	24	10	232	300	518	1	38	-	-
Totals,	-	7,078	118	257	663	304	669	1,764	341	155	4,271	2,858	6,101	45	878	9	$40

DETECTIVE DEPARTMENT.

Summary of Work from Nov. 1, 1907, to Nov. 1, 1908.

Total number of arrests,	344
Total number of prosecutions,	533
Total number of cases investigated (other than fires),	889
Total number of fires investigated,	3,335
Total amount of fines and costs imposed,	$2,831 92
Total value of stolen property recovered,	8,880 79
Total value of gaming implements forfeited,	300 00

Reports of Officers.

Capt. William H. Proctor, in Command of Steamer "Lexington."

During the winter months while I was not at work superintending work on the steamer I have worked on criminal cases at the Boston office. Extensive repairs were made on the steamer that required the boat to be taken out on the marine railway and kept out of the water from January 15 until April 15, when the steamer was put in commission, and I was obliged to be present during most of the time.

Fish have been plentiful in Buzzards Bay during the summer until the middle of October, and I have heard only one complaint of illegal fishing, which I investigated and learned that some person had set a net for bait at the head of the bay for the purpose of catching bait, and that said net had been destroyed by private parties.

The boat was put in commission on April 15 and put in winter quarters on the 15th of October.

Total number of cases investigated,	12
Total number of arrests,	7
Total number of arrests in which I assisted,	4

Among the most important cases investigated were the following: —

Frank E. Smith; crime, larceny and violation of insurance law. Found guilty; sentenced to serve two years in House of Correction and to pay a fine of $600.

Bennemet Francis; crime, perjury and larceny. Found guilty; sentenced to serve twelve months in House of Correction.

Sophiel Mitchell; crime, perjury and larceny. Found guilty; sentenced to serve eight months in House of Correction.

Joseph D. Socbason; crime, perjury and larceny. Found guilty; sentenced to serve six months in House of Correction.

Thomas Bailey; crime, perjury and larceny. Found guilty; sentenced to serve three months in House of Correction.

Have caused Gaetano Anile to be arrested in Italy for murder, and his case is still pending.

BARNSTABLE COUNTY. — OFFICER ERNEST S. BRADFORD.

Total number of cases investigated,	124
Total number of fires investigated,	14
Total number of arrests made,	33
Total number of arrests caused to be made,	64
Total number of days on special duty,	12
Total value of stolen property recovered,	$611

Among the most important cases investigated were the following: —

Henry F. Charles; crime, breaking, entering and larceny. Found guilty; sentenced to House of Correction in Barnstable.

George M. Bingham; crime, larceny (passing worthless checks). Found guilty; sentenced to House of Correction.

Otis J. Rogers; crime, breaking and entering and larceny. Found guilty; sentenced to House of Correction.

Augustus Rose; crime, assault with a knife. Found guilty; fined $75.

Frank M. Hathaway; crime, larceny in building. Found guilty; fined $25.

Nathan Peters; crime, forgery and uttering. Pleaded guilty; put on probation.

BRISTOL COUNTY. — OFFICER ALFRED B. HODGES.

Total number of cases investigated,	73
Total number of arrests in which I assisted,	5
Total number of arrests which I caused to be made,	6
Total number of arrests which I personally made,	6
Total number of fires investigated,	2
Total number of days on special duty,	28
Total value of stolen property recovered,	$439

Among the most important cases investigated were the following: —

William J. Edgerton; crime, fraudulently counting ballots at the municipal election in New Bedford in 1907. He was indicted by the grand jury, convicted and sentenced to six months in House of Correction. A stay of proceedings was granted, and the case went to the full bench for argument.

Alonzo Sawyer; crime, breaking and entering and larceny of hens on several occasions in Westport. He was traced by me on several occasions, not knowing who the party was until he was captured with the goods by the Fall River police. He was convicted on several counts, and sentenced to State Prison for from two and a half to three and a half years.

William H. McKay; crime, breaking and entering and larceny on several counts, also larceny of a horse and wagon. He was convicted on several cases, and sentenced to State Prison for from three to four years.

Thomas Harrington; arrested for me by the Providence police for breaking and entering and larceny of a large amount of household goods in Seekonk. Quite an amount of the goods were found scattered through Rhode Island and Massachusetts, but it was soon learned that Harrington had escaped from the Rhode Island Insane Hospital, and he was returned to that institution.

Dukes and Nantucket Counties. — Officer Thomas A. Dexter.

Total number of cases investigated,	74
Total number of arrests,	16
Total number of arrests caused to be made,	2
Total number of days special duty,	7
Total number of days of duty on steamer "Lexington,"	61
Total value of stolen property recovered,	$635

Among the most important cases investigated were the following: —

William B. Pease; crime, breaking and entering and larceny. Convicted; three months in jail waiting trial; case placed on file.

Ernest Cardoze; crime, two counts, forgery and uttering. Convicted; two months in jail waiting trial; case placed on file, restitution of property having been made.

Antone Silvia; crime, breaking and entering and larceny. Two months in jail waiting trial; previous record good; case placed on file.

Manuel Grasse; crime, breaking and entering and larceny. Two months in jail waiting trial; previous record good; case placed on file.

Robert Laidlaw: crime, larceny. Turned over to Brockton office for trial.

Henry Jones; crime, assault and battery. Convicted and fined.

Edward J. Lewis; crime, assault and battery. Convicted; sentenced to Massachusetts State Farm.

William Lewis; crime, assault and battery. Convicted; placed on probation.

Thomas Neilson; crime, assault and battery. Convicted; sentenced to House of Correction at New Bedford.

John Mendose; crime, larceny, two counts. Convicted; sentenced to House of Correction at New Bedford.

Charles Pratt; crime, forgery and uttering. Case pending.

Charles L. Printiss; larceny, two counts. Convicted; sentenced to pay $50 fine.

Manuel S. Martin; crime, larceny, two counts. Convicted; sentenced to House of Correction at New Bedford.

Raymond E. Powers; crime, larceny. Convicted; sentenced to County Jail.

Stephen E. Connors (juvenile offender); crime, larceny. Convicted; on recommendation of State Agent Davis, placed on probation, restitution of $50, money stolen, being made.

Cazunmia dos Santos; crime, breaking and entering and larceny in the night time. Convicted; sentenced to House of Correction at New Bedford.

Walter Rhino (juvenile offender); crime, larceny of $300. Sentenced to Massachusetts Lyman School.

ESSEX COUNTY. — OFFICER ARTHUR G. WELLS.

Total number of cases investigated.	52
Total number of fires investigated.	72
Total number of arrests made.	17
Total number of arrests I caused to be made, . .	6
Total number of arrests in which I assisted. . .	7
Total number of days on special duty. . . .	11
Total number of inspections for gasoline storage. .	3
Total value of stolen property recovered. . . .	$175

Among the most important cases investigated were the following: —

The case of the murder of Charles H. Emerson and Frank McDermott, police officers at Methuen. The perpetrators of the deed have not been apprehended.

The case of the murder of Ludwak Kubiak at Peabody, which was also without results.

Livigi Oreila, Michael Imperial and Michael Chilleo; crime, assault with intent to rob, being armed with a dangerous weapon, at Swampscott. Oreila and Imperial were sentenced to State Prison for from eighteen to twenty years, and Chilleo for from ten to twelve years.

John Andrew; crime, forgery, at Beverly. Sentenced to State Prison for not less than five nor more than seven years.

Harry Maddocks; crime, assault with intent to kill, being armed with a dangerous weapon, at Essex. Sentenced to State Prison for not less than four nor more than six years.

Hampshire and Franklin Counties. — Officer James McKay.

Total number of cases investigated,	88
Total number of arrests,	35
Total number of days on special duty,	14
Total value of stolen property recovered,	$501 35

Among the most important cases investigated were the following: —

Edward D. Bliss; crime, forgery and uttering. Sentenced to two years in House of Correction.

Fred W. Green, *alias;* crime, forgery and uttering. Sentenced to from three to five years in State Prison.

William Kellogg; crime, breaking, entering and larceny. Fined $50.

Ignus Kalowoski; crime, breaking, entering and larceny. Held for grand jury.

Delancey M. Steeves; crime, larceny. Sentenced to from three to four years in State Prison.

Louis E. Miles; crime, larceny. Sentenced to Concord Reformatory.

Irwin R. Fifield; blackmail. Case pending.

Hampden and Berkshire Counties. — Officer Thomas E. Bligh.[1]

Total number of cases investigated,	60
Total number of arrests,	9
Total number of arrests caused,	4
Total number of arrests in which I assisted,	4
Total number of days on special duty,	14
Total value of stolen property recovered,	$118

Among the most important cases investigated were the following: —

John F. Collins, William J. Howe and Theodore Bizanit; crime, breaking and entering. Found guilty; placed on probation.

[1] Appointed March 11, 1908.

William Watson; crime, breaking and entering a freight train. Found guilty; sentenced to three years in State Prison.

Lisbia Medzker; crime, keeping a disorderly house at Russell. Found guilty; fined $100; committed to House of Correction.

Edward F. Morton; crime, vagrancy and larceny. Found guilty; sentenced to Massachusetts Reformatory.

Darwin Clark; crime, larceny. Found guilty; placed on probation.

Lillian Ingraham; crime, larceny. Found guilty; placed on probation.

John White, *alias* Charles Murray; crime, breaking and entering. Case still pending.

Harry Arlington; crime, breaking and entering a freight train. Case still pending.

Nathan W. Haskell; crime, larceny of $1,400. Case still pending.

John J. Steele; crime, breaking and entering. Found guilty; sentenced to House of Correction for six months.

Neal Johnstone and John F. Conlon; crime, breaking and entering. Found guilty; placed on probation.

John Kimonski; crime, murder. Pleaded guilty to manslaughter; sentenced to State Prison for eight years.

Faith Davis, whose dead body was found floating in a pond at Palmer, investigation showed to be a suicide.

Hampden and Berkshire Counties. — Officer Frederick F. Flynn.[1]

Total number of cases investigated,	64
Total number of fires investigated,	76
Total number of arrests,	27
Total number of arrests in which I assisted.	3
Total number of arrests caused to be made,	5
Total number of days on special duty,	15
Total value of stolen property recovered,	$1,288 44

Among the most important cases investigated were the following: —

Dr. Henry G. Forbes; crime, abortion, two counts, in consequence whereof both women died. Indicted by grand jury; case pending.

Albert H. Hurd; crime, horse stealing. Found guilty; sentenced to State Prison for not less than four nor more than five years.

Alfred Hallaway; crime, horse stealing. Found guilty; sentenced to one year in House of Correction.

Homer H. Smith; crime, assault with a dangerous weapon. Found guilty; case placed on file.

Merton Meesick; crime, breaking, entering and larceny. Found guilty; sentenced to House of Correction for two years.

[1] Transferred to Essex-Middlesex District, April 1, 1908.

Merton Meesick; crime, larceny in a building. Found guilty; sentenced to House of Correction for six months.

Edward Malley; crime, larceny in a building. Indicted by grand jury; case pending.

Clarence E. Crosler; crime, larceny in a building. Found guilty; sentenced to House of Correction for nine months.

Samuel Abrahams; crime, forgery and uttering. Indicted by grand jury; case pending.

George W. Nash; crime, breaking, entering and larceny. Found guilty; sentenced to Massachusetts Reformatory.

William J. Howe, John F. Collins and Theodore Bazanait; crime, breaking and entering. Found guilty; placed on probation.

Solomon Sideman; crime, receiving stolen property. Indicted by grand jury; case pending.

C. Spence, *alias* George Clark; crime, fugitive from justice. Delivered to New York officer.

James A. Higgins; crime, keeping a house of ill fame, and violation of chapter 212, section 6, of the Revised Laws. Held for grand jury; case pending.

Grace Higgins; crime, keeping a house of ill fame, and violation of chapter 212, section 6, of the Revised Laws. Held for grand jury; case pending.

Salvatore Damico; crime, fornication. Found guilty; fined $15.

Antonio Averine; crime, fornication. Found guilty; fined $15.

I also assisted in the investigation of the murder of police officers Frank McDermott and Charles H. Emerson, at Methuen, on the night of Aug. 8, 1908; and the Louisa Staula murder, at Dedham, May 11, 1908.

Middlesex County. — Officer Charles E. Byrnes.

Total number of cases investigated,	83
Total number of fires investigated,	1
Total number of arrests,	33
Total number of arrests in which I assisted,	7
Total number of days on special duty,	23
Total value of stolen property recovered,	$1,345

Among the most important cases investigated were the following: —

Joseph Zeccolo; crime, murder. Pleaded guilty of murder in second degree; sentenced to Massachusetts State Prison for life.

Napoleon Rivet; crime, murder. Under indictment; case pending.

Jane Doherty; crime, murder and concealment. Under indictment; case pending.

Charles E. Petford; crime, polygamy. Found guilty; sentenced to ten months in House of Correction.

Isaac E. Wotton; crime, bribery. Found guilty; sentenced to six months in House of Correction; fined $500. Exceptions taken; now before Supreme Court.

Charles P. Lynch; crime, bribery. Case pending.

William C. Doherty; crime, bribery and political coercion. Found not guilty of bribery; case pending on charge of political coercion.

Norfolk and Plymouth Counties. — Officer John H. Scott.

Total number of cases investigated,	63
Total number of arrests made,	32
Total number of days on special duty,	3
Total number of days detailed at agricultural fair,	12
Total number of days detailed at race tracks,	6
Total value of stolen property recovered,	$0 50

Among the most important cases investigated were the following: —

Antonil Caffagne and Lorenzo Rezzo; crime, assault with intent to kill. Sentenced to four to seven years in State Prison.

Joseph Russo, Carmine Guarino and Nicola DeRosa; crime, wire thieves. Sentenced to nine to eighteen months in House of Correction.

Lucy Jones and Emma Thomas; crime, manslaughter. Sentenced to Woman's Prison.

William Levine; crime, larceny. Brought back from Milwaukee on requisition papers; case pending.

Louisa Staula; crime, murder case at Dedham. Case still under investigation.

John W. Nickerson; crime, assault with dangerous weapon. Case pending.

Conspiracy against Molt Brothers of Millbury. Considerable time was expended on this case, in view of the fact that it was a very complicated one; the investigation extending from May, 1907, to May, 1908, when the case was finally prepared for court. Michael Priest and Louis S. Cohen of Fall River, Mass., Benjamin Priest, 1st, Benjamin Priest, 2d, Samuel Priest, Edward Priest and George B. Brooks of Providence, R. I., Harris Goldberg, Schono Shocket and Israel Shocket of Woonsocket, R. I., were indicted by Worcester County grand jury for larceny. Seven of the above defendants were arrested, some of whom were extradited from Rhode Island. Before this case was tried, restitution to the sum of $6,000 was made to Molt Brothers, and the case was nol-prossed. I was materially assisted in this case by Detectives Murray and Molt of Worcester County.

Suffolk County. — Officer Arthur E. Keating.

Total number of arrests made,	16
Total number of arrests in which I assisted,	8
Total number of fires investigated,	155
Total number of corporation cases investigated,	42
Total number of insurance cases investigated,	6
Total number of militia cases investigated,	3
Total number of garages inspected,	8
Total number of inspections for gasoline storage,	29
Total number of inspections for storage of explosives,	1
Total number of other cases investigated,	33
Total number of days on special duty,	36

Among the most important cases investigated was the one at 293-295 Cambridge Street, in the city of Boston, where, at 2.19 A.M. on the 9th of July an explosion occurred in the fruit store kept by two Italians, which blew out the front of the building on the first floor, followed by a disastrous fire, resulting in the death of five persons, including one of the Italians that kept the store. Pietro Ruma, the other Italian, and Pasquale Amenta, were arrested on suspicion of having set the fire. They were afterwards indicted and placed on trial, charged with the crime of arson. The evidence, while circumstantial, seemed very strong and convincing. The trial lasted four days, and resulted in a disagreement of the jury. The case thereafter, on recommendation of the acting district attorney, was placed on file. The officers of Station 3 were of great assistance in the investigation and preparation of this case for trial.

Nine fugitives have been delivered by me during the past year on extradition proceedings: three to New York, one to Pennsylvania, one to Florida and four to Illinois.

Worcester County. — Officer Peleg F. Murray.

Total number of cases investigated,	45
Total number of arrests,	19
Total number caused to be arrested,	13
Total number of days on special duty,	12
Total value of stolen property recovered,	$1,400

Among the most important cases investigated are the following, in which Officer Robert E. Molt has assisted: —

Joseph Marsh; crime, larceny. Found guilty; sentenced to one year in House of Correction.

Felice Chiocchio; crime, murder. Case pending.

Nicholo Chiocchio; crime, murder. Case pending.

Louis Cohen; crime, larceny. Case nol-prossed; assisted Officer Scott.

Michael Priest; crime, larceny. Case nol-prossed; assisted Officer Scott.

Benjamin Priest; crime, larceny. Case nol-prossed; assisted Officer Scott.

Samuel Priest; crime, larceny. Case nol-prossed.

Schono Shocket; crime, larceny. Case nol-prossed.

Harry A. Murphy; crime, perjury. Pleaded guilty; sentenced to one year in House of Correction.

Mary Balch; crime, perjury. Case pending.

Nellie M. Decker; crime, perjury. Pleaded guilty; sentenced to one year at Sherborn.

Burton L. Turner; crime, violation of chapter 576, section 107, Acts of 1907, insurance laws. Placed on file.

Frank C. Wright; crime, subornation of perjury. Case pending.

Charles D. Rawson; crime, larceny. Pleaded guilty; sentenced to ten months in House of Correction.

Carroll H. Rawson; crime, larceny. Pleaded guilty; sentenced to eight months in House of Correction.

John Wallace; crime, breaking and entering and larceny. Sentenced to Reformatory.

Mrs. Ella J. O'Hearn; crime, forgery. Case pending.

Miss Mary O'Hearn; crime, forgery. Case pending.

Roland Foster; crime, breaking, entering and larceny. Placed on probation.

Nelson B. Smith; crime, manslaughter. Found guilty; sentenced to six months in House of Correction.

Harry Sullivan, *alias* Delarge; crime, breaking and entering. Found guilty; sentenced to three years in House of Correction.

Harry J. Dutton, *alias* Harry J. Prescott; crime, breaking and entering. Found guilty; sentenced to Reformatory.

Dennis Ryan; crime, larceny. Found guilty; sentenced to three months in House of Correction.

Petroi Cassanellie; crime, larceny. Found guilty; sentenced to three months in House of Correction.

Louis Wright; crime, breaking and entering. Found guilty; sentenced to one year in House of Correction.

Arthur J. King; crime, murder. Case pending.

Frank F. Mackey; crime, larceny. Found guilty; sentenced to pay a fine of $10.

Harry Rathburn; crime, illegal sale of liquor. Fined $50.

Worcester County. — Officer Robert E. Molt.

Total number of fires investigated,	101
Total number of other cases investigated,	27
Total number of arrests,	14
Total number of arrests caused,	20
Total number of days on special duty,	18
Total value of property recovered,	$400

Among the most important cases investigated were the following, in which Officer P. F. Murray assisted: —

Chas. G. Lawson; crime, defrauding insurance company. Jury disagreed; case came up next term of court, and he was defaulted.

George Glazebrook; crime, burning. Committed to epileptic hospital.

George A. Flagg; crime, arson. Adjudged insane; committed to insane hospital.

Mrs. Peter Codilere; crime, burning. Sent to sanitarium.

James Over, *alias* Vincenzo Caleri; crime, defrauding insurance company. Sentenced to three years in House of Correction.

Daniel Fitzgerald; crime, burning. Discharged.

Maria E. Osborn; crime, defrauding insurance company. Case placed on file.

Frank T. Giraldi; crime, arson. Case pending.

Joseph Harvill; crime, burning, breaking and entering and larceny. Case pending.

Arthur Harvill; crime, burning, breaking and entering and larceny. Case pending.

Francesco Millea; crime, arson and assault with dangerous weapon. No indictment on arson complaint; sentenced to two years in House of Correction on assault complaint.

Ernest L. Williams; crime, burning. Found guilty; sentence suspended.

Officer Michael J. Barrett. — Assigned to enforcing the Provisions of Law relating to the Arrest and Care of Tramps.

Total number of fires investigated,	185
Total number of other cases investigated,	7
Total number of garages inspected,	1
Total number of inspections for gasoline storage,	1
Total number of days on special duty,	28
Total number of arrests,	9
Total number of arrests in which I assisted,	10
Total number of arrests I caused to be made,	4
Total value of stolen property recovered,	$1,900

Among the most important cases investigated were the following: —

Ernest N. Gilman; crime, larceny. Pleaded guilty to twenty-one counts; sentence deferred.

Smith D. Collins; crime, larceny. Pleaded guilty to eight counts; sentence deferred.

Hawley J. Collins; crime, larceny. Pleaded guilty to ten counts; sentence deferred.

Lewis Beadle; crime, breaking and entering. Held in $1,000 for grand jury.

Philip Tremblay; crime, robbery. Found guilty; sentenced to one year in House of Correction.

On April 6, 1908, I was assigned to the enforcement of the tramp laws. Since that time I have visited every city excepting two, and nearly every town of any size in the State, and I find that the police officials have been particularly active in the enforcement of the tramp law. Of the applicants for lodging in the cities and towns that have been arraigned before the courts, the greater number have proven that they have been the victims of business depression rather than genuine tramps.

Officer Frank P. Hardiman.[1] — Assigned for Duty in the Waiting Room of the Executive Chamber.

Total number of cases investigated,	4
Total number of arrests,	13
Total number of arrests in which I assisted,	3
Total number of days on special duty,	42
Total number of arrests caused,	1

Officer Charles F. Rice, Chief Fire Inspector.

Total number of fires investigated,	301
Total number of fire inquests held,	52
Total number of days on special duty,	2
Total number of arrests caused for arson, malicious burning and intent to defraud insurance companies,	4

Among the most important cases prosecuted was that of Carlo Ernesto Berlati, who was charged with intent to defraud insurance companies. The jury disagreed on the case, and in default of bail defendant was committed to Salem jail and subsequently to the Asylum for the Criminally Insane at Bridgewater.

[1] Appointed Dec. 9, 1908.

Officer James Anderson, Fire Inspector for Hampden-Berkshire District.

Total number of fires investigated,	276

While I have had no particularly bad cases, there has been quite a number of very suspicious fires; but sufficient evidence to convict in these cases has not been obtainable, even with the assistance of an inquest. I believe, however, that a prompt and thorough investigation of each case, particularly where the question of insurance is involved, is, and has been, a check to incendiarism.

Officer Henry H. Collamore, Fire Inspector for Southeastern District.

Total number of cases investigated,	225
Total number of arrests in fire cases,	13
Total number of arrests caused by me,	4
Total number in which I assisted,	5
Total number of garages inspected,	8
Total number of days on special duty,	8

The most important case investigated was that of G. A. Guimond and G. N. Ladouceur of Attleborough. They were arrested for setting fire to their meat market on Pleasant street, June 1, 1908, and attempting to defraud an insurance company. Guimond confessed. Case pending in Superior Court.

Officer George F. Crittenden, Fire Inspector for Franklin-Hampshire District.

Total number of fires investigated,	190
Total number of other cases investigated,	9
Total number of arrests,	10
Total number of days on special duty,	8

Among the most important cases investigated were the following: —

John Hebert; crime, arson. Indicted by grand jury; case pending.

Gilbert Southworth; crime, setting forest fire. Found guilty; case placed on file.

Henry Neville; crime, setting forest fire. Found guilty; case placed on file.

George C. Dow; crime, setting forest fire. Found guilty; case placed on file.

Henry Hollon; crime, setting forest fire. Found guilty; sentenced to pay a fine of $40.

Henry Waltermeyer; crime, fugitive from justice. Delivered to Vermont officer.

Jacob Pawlikoski; crime, arson, two counts. Found guilty; sentenced to one year in House of Correction.

Konstanti Werner; crime, arson, two counts. Found guilty; sentenced to one year in House of Correction.

Frank Robleski; crime, burning building. Held for grand jury.

John Mitchell; crime, setting forest fire. Found guilty; sentenced to pay a fine of $20.

Officer Thomas F. Eustace, Fire Inspector assigned to Suffolk District.

Total number of fires investigated,	642
Total number of arrests in fire cases,	3
Total number of other cases investigated,	5
Total number of arrests in other cases,	3
Total number of gasoline plants inspected,	1
Total number of days on special duty,	29

Officer James J. Grady, Fire Inspector for Suffolk-Norfolk District.

Total number of fires investigated,	837
Total number of criminal cases investigated,	3
Total number of arrests in fire cases,	7
Total number of arrests in other cases,	1
Total number of arrests in which I assisted,	8
Total number of days special duty,	17

Among the most important cases investigated were the following: —

Conflagration in Chelsea, April 12, 1908, upon which I worked thirty days.

Joseph Merlo; crime, arson and burning. Merlo was connected with twenty-one fires in the South End. Sentenced to House of Correction for eighteen months.

William H. Cunningham; crime, robbery, assault with intent to kill, assault with intent to kill a police officer, and arson. Sentenced to House of Correction for three years.

Louisa Staula murder case in Dedham, upon which I worked seventeen days.

Officer Silas P. Smith, Fire Inspector for Suffolk-Middlesex District.

Total number of fire cases investigated,	258
Total number of other cases investigated,	2
Total number of arrests in fire cases,	20

Total number of arrests in other cases,	1
Assisted in arrests in other cases,	1
Total number of days special duty,	4

Among the most important cases investigated were the following: —

Reuben Johnson (colored); crime, arson. Convicted; sentenced to not more than ten nor less than eight years in State Prison.

Max Ruderman; crime, arson and breaking and entering and larceny. Pleaded guilty to breaking and entering in four counts; sentenced to two years in House of Correction; the indictment for arson was placed on file. Ruderman was an employee of the Boston Fire and Police Notification Company, and in his capacity as watchman had keys given him to enter certain buildings; and it was in one of such buildings, 105 Summer Street, where there had been eight fires and twelve or more cases of breaking and entering, that he committed the crimes to which he pleaded guilty.

Worked from April 12 to May 15 inclusive investigating the Chelsea conflagration; and again from August 14 to August 26 assisting Special Justice Cutler while conducting the inquest held in Chelsea to ascertain the cause of death of the seventeen persons who lost their lives during the fire of April 12.

General Offences prosecuted.

Abortion,	6
Accessory to abortion,	2
Accepting a bribe,	1
Adultery,	13
Arson,	43
Assault and battery,	27
Assault with intent to carnally abuse,	1
Assault with intent to kill,	4
Assault with dangerous weapon,	6
Attempt to commit arson,	1
Attempt to burn a building,	1
Attempt to commit larceny,	7
Bastardy,	1
Blackmail,	1
Breaking and entering,	91
Breaking glass,	1
Bribery,	3
Burning a building,	16
Concealing issue,	2
Disturbing the peace,	3
Drunkenness,	18
Failure to perform duty as an election officer,	4

Forgery,	7
Fornication,	4
Fraudulent counting of ballots,	1
Fugitive from justice,	1
Idle and disorderly,	1
Illegal gaming,	9
Illegal sale of liquor,	1
Keeping a disorderly house,	1
Keeping a house of ill fame,	2
Keeping gasoline without a license,	3
Larceny,	100
Larceny in a building,	2
Larceny from person,	2
Lewd and lascivious cohabitation,	13
Liquor nuisance,	19
Malicious mischief,	1
Manslaughter,	3
Murder,	8
Nonsupport,	6
Perjury,	8
Polygamy,	4
Political coercion,	2
Rape,	3
Receiving stolen property,	6
Robbery,	1
Selling cocaine,	1
Setting forest fires,	5
Suspicious persons,	9
Suffering female under twenty-one years of age to resort to place for unlawful sexual intercourse,	2
Tramps,	8
Unnatural act,	1
Vagrancy,	2
Violation of automobile law,	9
Violation of fishery law,	2
Violation of foreign corporation law,	1
Violation of insurance law,	7
Violation of militia law,	1
Violation of Sunday law,	25
Total,	533

REPORTS OF ACCIDENTS IN MANUFACTURING AND MERCANTILE ESTABLISHMENTS.

Section 17, chapter 106 of the Revised Laws of this Commonwealth provides that: —

> All manufacturers, manufacturing corporations and proprietors of mercantile establishments shall forthwith send to the chief of the district police a written notice of any accident to an employee while at work in any factory, manufacturing or mercantile establishment operated by them, if the accident results in the death of said employee, or in such bodily injury as to prevent him from returning to his work within four days thereafter. The chief of the district police shall forthwith transmit to the sender of such notice a written or printed acknowledgment of the receipt thereof, and he shall keep a record of all accidents so reported to him, of the name of the person injured, of the city or town in which the accident occurred and the cause thereof, and shall include an abstract of said record in his annual report. Whoever fails to send notice of an accident as required by this section shall be punished by a fine of not more than twenty dollars.

In compliance with the provisions of this statute, there have been reported to me by various manufacturers, manufacturing corporations and proprietors of mercantile establishments in this Commonwealth 2,050 accidents which have occurred from the first day of December, 1907, to the first day of November, 1908.

Of this number, 42 were fatal, 470 were serious in their nature, and 1,538 were classified as "slight injuries."

Of the total number, there were 731 arising from causes other than in the operation of machinery, constituting more than 35 per cent. of the entire number reported, and it is assumed that such cases are not of the class to which the law applies; and, while it would not appear necessary to enumerate their causes in this report, I have shown the nature

and circumstances of their happenings in the figures hereinafter given.

The fact that such accidents as above referred to are so promptly reported by manufacturers and others, although there would seem to be no legal requirement for so reporting them, would seem to show a desire and intent on the part of those interested to observe the provisions of the law in its broadest sense, rather than in any degree to violate any of such provisions.

The proportion of such accidents from year to year, with their similar conditions and results, is about the same, increasing materially the total record of accidents; while from the facts connected with them, as herein clearly shown, it can readily be seen that no provision could be made by law to meet the various contingencies that arise from time to time.

The methods so largely employed for the protection of employees from personal injury, in accordance with the requirements by statute provided, have resulted in appreciable benefit, and many serious accidents have undoubtedly been averted through such precautionary means. Constant attention is enjoined in connection with the enforcement of the statutes relative to the proper guarding of dangerous machinery; the inspectors of this department whose duty it is to see that the provisions of such statutes are properly complied with, being fully impressed with the importance of that duty. It is a source of considerable gratification to be able to state that the instructions and orders issued from time to time, in connection with such provisions, have always been met with a ready response and an evident desire to arrange for the best possible conditions to insure safety to their employees by those having charge of the management of the works where the provisions for the protection of their employees have been found inadequate.

In the majority of cases reported the facts are very clearly and fully set forth, the name of the person injured being given, with the time, place and cause of the accident, persons forwarding such reports complying with the law as fully as possible; nevertheless, a large number of reports are received which do not contain all the information required

by the provisions of the statute, and others do not furnish such information as definitely as required. In all such cases the persons forwarding such reports are requested to furnish whatever information is lacking, in order that the reports may be complete; this they have invariably done, showing a desire to comply with the provisions of the law when fully cognizant of their nature.

It is a matter of no slight importance to note how large a proportion of the accidents reported might have been averted had reasonable care and ordinary caution been exercised on the part of those injured. I refer to the number of persons injured while attempting to clean or oil the machinery, or to pick off waste or other material which has lodged in some part of the machine, without stopping the machine before executing such purpose; also to those who, in connection with the movement of elevators, neglect to take the necessary precaution in the using or working of such elevators. Of the total number of accidents arising in connection with the operation of machinery, namely, 1,239, 465, or more than 36 per cent. of the entire number, were caused in this manner; and of the number of accidents caused by elevators, namely 79, 34, or more than 39 per cent. of that number, were caused through such neglect. In all such cases the persons injured were acting in direct violation of the rules which prohibit the cleaning of machinery while in motion, or attempting to remove waste or other material without first stopping the machine, and the careless or improper handling of elevators. Under such circumstances safeguards are practically of no avail, due care being necessary in every event, whatever means for the protection of life or limb may be used or adopted.

Every accident reported, whatever its origin or source, is recorded by this department, as a strict construction of the statute makes this necessary, no particular class of accidents being denoted or specified therein.

An investigation is made by an inspector of this department in each case of fatal accident reported, as well as in each case where such an investigation is deemed necessary by the nature and condition reported, in order to ascertain if

more adequate means of protection can be applied to insure against the possibility of the recurrence of similar accidents.

The total number of accidents reported to this department as occurring while the persons injured were operating machinery is 1,318, which number includes those injured by elevators or hoistways.

The following list gives causes of accident, showing the number of cases occurring from each cause, and whether fatal or otherwise: —

Cause.	Fatal.	Otherwise.
Injured by: —		
Machinery in cotton, woolen and paper mills and shoe factories,	2	815
Machinery in planing or saw mills, iron works or other mechanical works,	7	274
Shafting, belting or pulleys,	7	133
Elevators, or while working about the same, the majority being caught between car and flooring,	7	52
Falling into elevator wells,	5	9
Falling of elevator cars,	–	6
Scalds and burns,	1	94
Receiving electric shock,	2	1
Falling, principally from staging,	2	188
Being struck by heavy weights,	1	165
Flying steel, etc.,	–	14
Splinters, etc., all being slight in nature,	–	71
Various causes not specified above,	8	186
Totals,	42	2,008

The injuries received in the 2,050 cases reported were, of course, varied both in nature and degree, many causing permanent disability in some form, the larger number, however, being slight in their nature. The greater number consisted of injury to the hand, there being 1,189 such cases; of these, the injuries to the finger and thumb were 919. In each of 23 cases one finger was lost; the thumb in 6 cases; two fingers were lost in each of 8 cases; in each of 5 cases three fingers were lost; in each of 3 cases four fingers were lost; in 1 case the four fingers and part of the hand were cut off. In 123 cases partial loss of one or more fingers or of the

thumb occurred; in each of 17 cases a finger was broken. There were also a large number of cases in which the finger or thumb was jammed and bruised. In each of 2 cases the left hand was lost, and in 1 case the right hand was lost. The wrist was broken in each of 3 cases. In a number of cases there were slight injuries to the hand or wrist, such as cuts and bruises. There were 162 cases in which the arm or shoulder was injured. In each of 2 cases the right arm was lost, and the left arm in each of 2 other cases. In each of 29 cases the arm was broken. In 1 case the shoulder blades were broken; in 3 cases the shoulder was dislocated. There were 154 cases of injury to the head, the larger number being scalp wounds. There were 10 cases of fracture of the skull. Thirty-eight cases of injury to the eye were reported, varying from slight cuts and bruises to the loss of the right eye in each of 2 cases. Injuries to the leg occurred in 108 cases. In each of 16 cases the leg was broken or fractured; in 1 case the ankle was broken; several ankles were reported as sprained. There were 197 cases of injury to the foot reported; in 2 cases the right foot was lost. Several cases were reported in which the loss of toes resulted. Fifteen persons had ribs broken; 3 persons were struck in the abdomen, in 1 case hemorrhages following the injury. Forty-one suffered injuries to the back or side, and 5 were injured in the chest. Five suffered from internal injuries.

In addition to the numbers enumerated herein, there were a large majority of accidents resulting in bruises, contusions, cuts, lacerations, loss of finger nails, etc., all painful and more or less severe, but of that nature which promised full and speedy recovery.

A very large proportion of the injuries mentioned were suffered by laborers in the various duties pertaining to their several callings.

It is thought advisable to mention here, more in detail, some of the more serious cases reported: —

A girl of fourteen, standing near a spinning frame, deliberately removed the cover from the gearing to show her companion how near she could put her fingers to the gears. In consequence of this folly the first finger of her right hand

was crushed, resulting in the amputation of the finger. In another instance two boys were playing around a spinning frame; one caught hold of the under part of the frame, his right hand being caught by the gears; the loss of four fingers was the result. A man, without permission, started a saw in a saw mill with the intent to cut a pine board. As he had no experience in such work, the board was jerked from his hand, which brought the hand across the saw, and the four fingers, with part of the hand, were cut off. A man, while trying to pick some cotton waste from a picker machine in motion, was caught by the little finger of the left hand; the hand and wrist were badly mangled, amputation of the hand resulting. A man lost two fingers of his right hand while fixing a machine, the machine being in motion. While oiling a fan, a man's left hand was caught in the fan, which was in motion, the hand being severely injured. In another case a man carelessly placed his hand under the grate bars of a picker, and his left hand was caught, causing the loss of three fingers. A woman badly injured the little finger of her right hand, which was caught in the gears of a speeder she was cleaning while the machinery was in motion. A woman, the tender of a speeder, was cleaning the frame without stopping the machine, and, as a result, the hands and fingers were drawn in and so badly crushed as to cause amputation of the hand. Another woman started to stop a speeder machine, and before it had come to rest commenced to clean it, in consequence of which the waste she was using became caught in the twist gear, and the forefinger of her left hand was drawn in and crushed. In order that she might pick some waste from a roll, a woman removed the covers to the gears, and started the frame. As a result, the fingers of one hand were caught between the gears, the second finger being cut off and the third badly injured. A woman, while attempting to run a cutting machine during the absence of the man in charge, was caught by her left hand, which was drawn into the cutter up to the wrist, the hand being so badly crushed as to cause amputation at the wrist. While working on a circular saw, a board became wedged, causing it to rebound, striking the operator in the face and injuring the

right eye to such an extent that it had to be removed. The frontal bone of his nose was also broken. In one instance an emery wheel broke, and one of the flying pieces struck a man in the face, badly crushing and bruising it. A reel boy, who was feeding paper through the calender rolls of a machine, caught the fingers of his right hand between the rolls, causing the loss of the four fingers. A man, working on a buzz planer, lost the ends of his second, third and fourth fingers of the right hand, the same being cut off. In a similar case a man lost the second and third fingers of his left hand. A man, working on a loom, in some manner caught his left hand between the breast beam and protector rod; the hand was crushed, one bone being broken in two places. The glove worn by a man was caught in a reamer, which drew in the man's hand, literally tearing it from the forearm. A very painful accident was caused in one case. A man was caught by his left hand in a belt and whirled twice about the shaft, his arm being broken completely off between the wrist and elbow, allowing him to fall to the floor. He was taken to the hospital, where it was found necessary to amputate the arm above the elbow. In order to reach some stock piled on the work table, a girl placed a stool on the table and stood upon the stool; this caused her to strike her head against the shaft, and her hair was caught by the shaft, with the result that her scalp was torn off, together with one ear. In another case a man's right arm was broken in seven places by being caught in a belt and drawn over a shaft. A man, while adjusting a set screw on a hanger, had his right arm caught between the spokes of a pulley, causing a fracture of the arm. While dressing a belt, the arm of a man was caught in the belt and badly fractured. One man, while tightening up a color press, accidentally set it in motion, causing his arm to be so badly crushed that amputation was necessary. Another accident occurred to a man while operating a wool breaker, his right arm being caught and so badly injured that amputation above the elbow became necessary. A compound fracture of a woman's right arm at the elbow was the result of reaching down on a loom in such a manner that her body, pressing against the shipper, started the loom.

her arm becoming caught. A man, while inspecting a belt, slipped, fell upon the belt, and was carried partly around a pulley, breaking his shoulder blades and collar-bone. While reaching under a machine, a man was caught by the gearing, forced under the machine on his right side, fracturing and dislocating his shoulder. The upper part of his clothing was twisted nearly off. A hydro-extractor in a dye house flew in pieces, and one of the pieces, striking an employee, broke his leg below the hip. A portion of the right foot of one man was cut off by the knives of a moulding machine. A very serious accident occurred to one man. While placing a belt on a pulley his coat caught upon the shafting and he was carried around the shaft ten times, his feet and legs striking the ceiling. When the machinery was stopped, it was found that he had received serious injuries, there being a compound fracture of his right leg, and internal injuries. While a man was leaning over the gate of an elevator well, and looking down to locate the elevator, it descended, catching his head between the floor of elevator and the gate, fracturing his skull and causing other injuries of a serious nature. A woman was standing in front of an elevator gate, and pulled the starting wire to bring the elevator down. Her arm was resting on the gate in such a manner that the hand projected over the elevator well, and as the elevator came down it struck the hand, breaking the wrist. A man lost control of the staging he was using in connection with his work as a painter, and fell about 25 feet to a platform beneath. Several ribs were broken by the fall, and other injuries resulted to his head, face, left arm and hip. One man, while crossing a bridge from one part of a factory to another, lost his bearings on account of steam which was blowing across the bridge, and stepped off the side of the bridge, falling to the ground, breaking his collar-bone. While fixing a window sash, a man, losing his balance, thrust his right arm through a pane of glass, severely lacerating the muscles of the forearm. In consequence of the slipping of a ladder, a man fell a distance of 9 feet, fracturing two ribs and causing other injuries to his side and head. A man fell 20 feet from a staging, fracturing both bones of the right leg. In consequence of the

slipping of the staging on which a man was standing, he fell about 5 feet, his right hand and arm entering a hole in the ground, causing a compound fracture of the elbow. Another man fell from the roof upon which he was working, his left leg and ankle being broken. As the result of an explosion of fiberloid mixture, a man working on a staging was blown to the floor, breaking his leg. As a man was wheeling a barrow, he stumbled, striking his abdomen against the handle of the barrow, causing severe internal injuries which produced hemorrhages. While moving bales of cotton, one fell upon a man's leg, breaking it at the ankle. The right eye of one man was severely injured by a particle of molten metal which flew into it. A man, employed in a blacking factory, was badly burned about the face and body, caused by an explosion which took place in consequence of his neglect in not properly cooling off the bottom of a mixing kettle in which boiling oil and naphtha were to be mixed. In one case a man was barring a fire when an explosion of gas took place, severely burning his face and arm. Another man was badly burned about the face and neck by trying to extinguish a fire which had broken out in his machine.

As before stated, there were 42 accidents which resulted fatally, and the facts, as far as they could be ascertained by the inspectors investigating the same, are here given in substance, with the name of the person injured, establishment in which accident occurred, city or town in which located, date of accident, and circumstances attending each individual case.

Albert Jeassaname, employed by the Chemical Paper Company, Holyoke. On Dec. 5, 1907, this man was employed as the third hand on a paper machine, having been so employed for the six weeks immediately preceding the accident. As he was crossing a platform, provided for the operators to cross over the machine in order to take the weights from the levers and the press rolls, he apparently lost his balance and fell upon a 12-inch belt, which drew him up to the 4-foot drum, the drum crushing his chest and killing him instantly.

Frank Sonia, employed by the Fore River Ship Building Company, Quincy. On Dec. 6, 1907, this man was struck on the head by a

piece of timber 30 feet long, which had been used in temporarily strengthening a section of the keel of the battleship "North Dakota." While being lowered, one end struck the ground, releasing the hook from the ring and causing the piece of timber to fall, striking the man as stated, crushing his skull and causing death.

Eugene Faust, employed by the Dwight Manufacturing Company, Chicopee. On Jan. 7, 1908, this man was painting the ceiling of the spinning room, being seated on a stage about 9 feet above the floor. For some unknown reason he apparently reached to the ceiling with both hands, grasping two coils of live electric wires. He was seen to drop through the staging planks to the floor, and when assistance arrived he was found to be dead. The electrician stated that the wire had a voltage of 400.

Arthur T. Grant, employed by the New England Sanitary Product Company, Spectacle Island, Boston harbor. On Jan. 22, 1908, this man, with others, went to assist in moving an engine off the center in order to start it up. He took hold of a driving belt and was pulling downward, when the engine suddenly started, carrying his arm down between the belt and pulley, throwing him to the floor and fracturing his spine. He was taken to the Emergency Hospital in Boston, where he died Jan. 29, 1908.

Lucius D. Hunt, employed as a night watchman at the Mason Building, Boston. On Feb. 6, 1908, this man was in some unknown manner caught between the top of the elevator and the sixth floor. When found, at about 6.45 p.m., he was dead, his head being inside of the elevator and his body on the hall floor. There were no witnesses to the accident.

Daniel Healey, employed by the Brockton Gas Light Company, Brockton. On Feb. 19, 1908, this man, as appears from the statement of one Charles Martel, who was engaged with Healey in the purifying house at the time of the accident, went up on the elevator to the platform of the purifying tank. Martel had left him to go to the floor above, and hearing a groan, and finding that he could not see Healey by looking through an opening in the floor, went to the elevator well and saw the elevator descending, with Healey lying on the floor partly over the edge of the car, from which position he dropped to the floor below. He died about five minutes after the accident. The accident was probably caused by heart failure.

Faustino Guazzino, employed by the Berkshire Paper Company, Adams, Mass. On March 12, 1908, this man had charge of a rag-thrashing machine, which he had received orders not to clean out

while in motion. He went to the top of it to sweep out the dust, and apparently lost his balance, falling into the machine, by the cylinder of which he was thrown out upon a pile of rags, fatally injured, dying before medical help could be procured.

Frank P. Gilmore, employed by Seaverns & Co., produce dealers, Boston. On March 18, 1908, this man went to the cellar of the building where he was employed, to get a coil of hoops, using the elevator. He evidently started the power to ascend, and must have fallen forward, probably through faintness or a shock, in such a manner that his head hung from the edge of the car, as he was discovered a few seconds after the accident happened with his head nearly severed from his body, it having been drawn upward between the elevator and floor. Death was apparently instantaneous.

George Tate, employed by the General Electric Company, Pittsfield. On March 20, 1908, as this man was climbing to the top of a transformer to make a pipe connection for the air pump, he slipped from the top rung of a ladder, falling to the floor and striking his head, causing a fracture of the skull at the base of the brain. He was taken to the hospital, where he died at 9.15 P.M. the same date.

Mrs. Fred Goolett, Marlborough, Mass., died as the result of a shock received in consequence of stepping through an open door of the elevator well on the street floor of the store of Henry Siegel Company, on Washington Street, Boston. It would appear that the elevator was in the basement, and the door of the well on the floor above being open, this woman, who was a customer, supposing the elevator to be level with the floor, stepped into the well, and upon the top of the elevator. The woman probably suffered from heart trouble, and the shock caused death within a short time after the accident, which occurred April 13, 1908.

David White, employed by the Hinsdale Woolen Mills of Hinsdale. On April 20, 1908, this man, who had been night watchman for a number of years, was fatally injured by falling down the stairs of the mill. As the time clock showed that he had visited its locality at 8 o'clock P.M., it would appear that he must have fallen at about that hour, as he was found in the morning unconscious at the foot of the stairs. He did not regain consciousness, and expired about noon of that day, from fracture of the skull. The location of the accident was a stairway leading from the picker room, and at the top of this stairway were double doors opening in. The supposition is that when reaching for the latch he slipped and fell backwards.

Adam Kelso, employed by the American Tube Works, Somerville. On April 29, 1908, as this man was running the planer, on which he had worked for years, in some unknown manner he fell and caught his head between the carriage of the planer and an iron column, death being instantaneous.

Charles Curran, employed by the Smith Tablet Company, Holyoke. On May 8, 1908, this boy, fifteen years of age, was employed in the packing room as a helper. At the time of the accident he was assisting the packer, and went to the elevator with an empty packing case. Another employee was holding up the automatic gate for the purpose of reaching the chain cable, and Curran, evidently supposing the car to be level with the floor, although it was really 8 feet above, attempted to place the case on what he supposed was the elevator floor. The case fell down the well of the elevator, a distance of 30 feet, and losing his balance he fell with it, fracturing his skull. He was taken to the hospital at once, where he died one and one-half hours later.

William Bates, employed as a waiter in the New American House, Hanover Street, Boston. On May 9, 1908, this man was carrying an order from the first to the third floor, using the baggage elevator, which is underneath the regular passenger elevator, the entrance being on the opposite side to that of the passenger elevator. The presumption is that when he arrived at what is known as the "parlor floor" he jumped off the elevator while it was in motion, lost his footing and fell back down the elevator well to the basement. His head was crushed, and he lived but a few minutes.

Kota Oye, a Japanese boy, employed by the New American House, Hanover Street, Boston. On May 13, 1908, this boy, who was employed to operate the elevator, was caught between the elevator and the second floor. No one saw the accident, but from appearances the boy, having received a call, started the elevator, and, finding he had not closed the door at the entrance to the elevator, reached out to do so, his arm being caught between the elevator and top of the door, forcing him forward over the edge of the elevator floor. Death was instantaneous.

Joseph Protovski, employed by S. Slater & Sons, Incorporated, of Worcester. On June 1, 1908, this man was found at the foot of a flight of stairs, in a dying condition. A doctor was called, and pronounced death as due to heart failure. No one was near him at the time he fell.

Joseph McCarty, employed by the Abbot Worsted Company, Forge Village. On June 9, 1908, this man, while passing the pulley which drives the doffer of No. 2 car, was caught by his overalls and drawn between the belt and pulley, causing him to lose his balance and fall on the large gear driving the doffer; his skull was fractured by the teeth of the gearing. He was carried to the Lowell Hospital, where he died two days later.

John Scott, aged seventeen years, employed by the Berkshire Cotton Manufacturing Company, Adams. This boy was employed in the spinning room as a back boy; and on June 10, 1908, while the elevator in the factory was coming down from the floor above, he leaned over the open hatchway under the rod which carries the elevator floor, and pulled a handkerchief from the pocket of the boy in the elevator; before he could recover himself, the descending elevator caught his neck between the main post and the floor brace and drew his body over the edge of the hatch on to the car, breaking his neck and three ribs, causing death.

Oscar A. Johnson, employed by Field & Wild, Quincy. On July 6, 1908, while in the act of lowering a derrick, this man was struck on the head by the mast, which fractured his skull and broke his neck, causing instantaneous death. There were no eye witnesses to this accident; but from appearances it would seem that the mast pivoted around in a different direction to that in which he intended it to fall, thus striking the man.

James Nolan, employed by the Greylock Mills, North Adams. On July 10, 1908, this boy, fifteen years of age, who was employed in the mule room as a back boy, thoughtlessly lay on his stomach on the top floor of the mill, leaning over to look down the elevator shaft; while so doing he was caught at the neck by the elevator coming down, and death from strangulation was instantaneous.

Joseph Rock, employed by the American Steel and Wire Company, Worcester. On July 14, 1908, this man, while employed as a switchman on the yard tracks of the above named company, jumped from a train of coal cars to throw the switch, giving the signal for the engineer to come ahead, which the engineer did. Shortly after, noticing the cars pulled hard, the engineer discovered that Rock was being dragged by a car. The train was immediately stopped, when it was found that one wheel had run over the man, he having sustained a compound fracture of the upper right arm, three ribs broken and internal injuries. He died at the City Hospital at Worcester the following day.

Albert E. Breen, employed by F. W. Bird & Son, East Walpole. On July 21, 1908, while at his work, this man suddenly fell to the floor in an unconscious condition. He was carried out of the building and a doctor summoned, but he died before the arrival of the doctor, who pronounced it a case of heart failure.

Elmer Holbrook, employed by W. H. Kelly & Co., Boston. On July 30, 1908, this boy, who had been in the employ of the above company about ten days, and had no knowledge of the method of operating the elevator and no authority to use it, returned from lunch, and, finding the elevator at the street floor, rode up to the fourth floor. An employee named Fayes, hearing the elevator pass the door, which was open, noticed the boy Holbrook with one foot on the floor and the other on the car, evidently intending to leave the car, which was still in motion. This caused him to lose his balance and fall under the car, down the shaft, a distance of 60 feet. He was immediately taken to the Emergency Hospital, where he died the same afternoon.

Jerry Brown (Xavier LeBrun), employed by the Farr Alpaca Company, Holyoke. On Aug. 4, 1908, this man fell from a staging, about 15 feet, striking his head upon the tension bar of a crabbing machine, from the result of which he died in a few minutes after the accident, death being caused by a broken neck.

W. M. Krom, employed by the North Packing and Provision Company, Somerville. On Aug. 5, 1908, while employed as an oiler, and oiling the shafting boxes over a lard receiver, this man fell through a manhole into the receiver, which is a large iron tank about 10 feet high. At the time there were some four or five thousand pounds of lard in the receiver. There were no witnesses to the accident, but an employee named John Coster heard a noise some minutes after he had seen Krom going up the steps leading to the top of the receiver. Coster went up the steps to ascertain the cause of the noise, and, being unable to see Krom, gave the alarm. Krom was found at the bottom of the receiver, dead.

David Burns, employed by the Pacific Mills, Lawrence. On Aug. 6, 1908, this man, who was employed as a soaper tender in the print works department, climbed onto the guard rail of a soaper while it was running, and in getting down again his apron was caught and wound around a driving shaft of the machine, drawing the man against the machine and breaking his back. Death was instantaneous.

Joseph Marcarni, employed by the New Can Company, Incorporated, 326 A Street, South Boston. On Aug. 8, 1908, as this man was putting a 2-inch belt on a pulley, standing on a box to do so, instead of using a step-ladder provided for the purpose, he stooped to speak to one of the employees who was standing on the floor, when his right arm was drawn into the shafting. His right arm was badly broken in several places; he was also badly cut about the face. He was at once taken to the Relief Hospital, where he died the same day from the injuries received.

George Lincoln, employed by the Lowell Electric Light Company, Lowell. On Aug. 8, 1908, this man, while at work as a lineman in Billerica for the above company, received an electric shock while coming down a pole, through coming into contact with the live wires. He was instantly killed.

John Dahl, employed by the Fore River Ship Building Company, Quincy. On Aug. 17, 1908, this man, while working on a boring machine, slipped and fell between the tool holder and the turbine hub which he was boring, sustaining very severe injuries. He was at once taken to the Quincy Hospital, where he died the following day.

Tony Ramanchin, employed by the Haverhill Box Board Company, Haverhill. On Aug. 21, 1908, this man, who was a helper on the paper machine, in some way became caught between the couch rolls and the cylinder mould, passing between the rolls, and was instantly killed.

Edward J. Carroll, employed by the Fore River Ship Building Company, Quincy. On Aug. 22, 1908, this man was struck by a steel porter bar, which was being used to draw a brass casting under the steam hammer. It appears that after striking the first blow with the hammer the control of the bar was lost, and such bar, being struck by the hammer, threw Carroll to the floor, causing a fracture of the skull and other serious injuries, from which he died in the Quincy Hospital on September 6.

Frank H. Barrett, employed by the Washburn Realty Trust Company of America, 630 Washington Street, Boston. On Aug. 24, 1908, this man was apparently making repairs under the elevator car, not having shut off the power. A truckman named Maloney, who had just placed a case of goods on the elevator, called down

"All right." Receiving no reply, he started the car, and, in consequence of the hoisting gear being disconnected, the car dropped to the basement, a distance of half a story, crushing Barrett. He was at once taken to the hospital, but life was extinct before arriving there.

Concertina Impressia, employed by the Star Worsted Company, Fitchburg. On Aug. 25, 1908, this girl, aged fourteen years and seven months, was standing at the end of her spinning frame, waiting for the signal to stop it. She had one arm in the sleeve of her coat, and, while reaching to the floor to pick up a comb she had dropped from her hair, the loose part of the coat caught on the end of a shaft, carrying her body with it. Her head struck the projecting parts of the machine, causing fatal injuries, from which she died within a few minutes.

Patrick Graham and Patrick Cunningham, employed by Lever Brothers Company, soap manufacturers, Cambridgeport. On Sept. 17, 1908, these men, in the course of their work, handled some infected skins. Graham complained of a sore on his finger, and went to the Carney Hospital, where he died on September 24 from blood poisoning. On October 8 the man Cunningham complained of a swelling on his neck. He went to the Massachusetts General Hospital, where he died on October 10, from blood poisoning. Further action in connection with this matter was taken by the State Board of Health.

James Hingham, employed by the Pacific Mills, Lawrence. On Sept. 30, 1908, this man, employed in the aniline black room, mixing the dye liquor, being experienced in this work, was weighing a quantity of chlorate of soda. He used an iron shovel to break a portion of the soda, which caused it to explode, burning him badly about the body. He was at once taken to the Lawrence General Hospital, where he died from the effects of his injuries the following day.

Charles Duggan, employed by the Fore River Ship Building Company, Quincy. On Oct. 1, 1908, while employed in the engine room of the United States steamship "North Dakota," painting, it became necessary to shift the staging, and while doing so a plank, which was suspended about 20 feet above the staging, was dislodged from its position by the swinging of the staging and fell upon Duggan, striking him upon the head, causing fracture of the skull, from which he died in a short time.

Giovanni Conzole, employed by the American Woolen Company, Lawrence. On Oct. 6, 1908, this man, who was employed in the wool-drying room, was carrying a large bundle of partly dried wool in a sheet on his shoulder; the sheet was caught in a shaft and coupling which was over a doorway through which he had to pass. He held on to the sheet and was drawn over the shaft, being instantly killed.

Joseph Aronovitz, employed by the Union Parlor Furniture Company, 10 Lyman Street, Boston. On Oct. 8, 1908, this man was killed by being caught between the elevator floor and the wall of the elevator well at a point between the third and fourth floors. It would appear that he had attempted to stop the car while standing on the third floor, but had pulled the wrong rope, causing the car to ascend instead of descend, and, having his head in the well, he was caught by the floor of the car and dragged into the well, having been found suspended by his neck.

Peter Charles and Joseph Alie, employed by the Fiberloid Company of Indian Orchard. On Oct. 19, 1908, while these men were engaged in mixing pyroxelene and camphor, the mixture exploded, causing serious injuries to the two men by burning, from which they died in a few hours. As both of the men were unconscious, the exact cause of the explosion is not known.

Salvatore Grella, employed by Kibbe & Brothers, Springfield. On Oct. 23, 1908, this man, while tending a machine used for pulling candy, stooped over the machine to secure some candy which had dropped to a shelf below the machine. As he raised his head one of the revolving arms of the machine struck him over the left ear, throwing his head against the stationary arm, crushing it and causing his death, which occurred some thirty minutes later. He had been cautioned not to take the candy from the shelf while the machine was in operation.

Forfeited Liquors and Confiscated Weapons.

Section 80, chapter 100 of the Revised Laws, provides that: —

> Any liquor so forfeited shall, by the authority of the written order of the court or trial justice, be forwarded by common carrier to the chief of the district police, who upon receipt of the same shall notify said court or justice thereof. Said officer shall sell the same, and after paying the cost of the transportation of the liquors he shall pay over the net proceeds to the treasurer and receiver general. The officer who serves the order above named shall be allowed therefor fifty cents, but shall not be entitled to receive any traveling fees or mileage on account of the service thereof.

In compliance with the above law, I have received from various officers of the Commonwealth certain liquors, and the vessels containing the same, which have been delivered to me as having been seized and forfeited by virtue of said act, and have given my receipt for the same.

The quantity of liquors so received from various cities and towns during the year ending Nov. 30, 1908, was: —

Spirituous liquors, . .	2,186 gallons, 3 quarts, 1 pint.
Malt liquors, . .	9,820 gallons, 1 quart, 1 pint, 3 gills.
Number of seizures, ...	1,078

From the proceeds of the sales of such forfeited liquors, and the vessels seized therewith, I have paid over to the Treasurer and Receiver-General the sum of $1,000.

Section 2, chapter 583, Acts of 1908, provides as follows: —

> Whenever any person is convicted of carrying a pistol, revolver or other weapon or article contrary to the provisions of section two of said chapter one hundred and seventy-two, the weapon or article so carried by him shall be confiscated to the use of the commonwealth. Any pistol, revolver or other weapon or article so confiscated shall, by the authority of the written order of the court or trial justice, be forwarded by common carrier to the chief of the district police, who, upon receipt of the same, shall notify said court

or justice thereof. Said officer may sell or destroy the same, and, in case of a sale, after paying the cost of forwarding the article he shall pay over the net proceeds to the treasurer and receiver-general.

In compliance with the above law, I have received from various officers of the Commonwealth certain weapons and articles covered by 66 seizures, made by virtue of said act, and have given my receipt for the same; this report covering such weapons and articles as were received prior to the first day of December, 1908.

The sum of $35 has been paid over to the Treasurer and Receiver-General, being the net proceeds from the sale of part of the weapons above referred to.

Appropriations and Expenditures.

Detail.	Appropriations.	Expenditures.	Amount unexpended.
Salary of the Chief of the District Police, . .	$3,000 00	$3,000 00	–
Salaries of the members of the detective department, including the deputy chief, . .	35,600 00	35,540 32	$59 68
Salaries of the members of the inspection department, including the deputy chief and the chief inspector of boilers,	72,900 00	72,043 00	857 00
Salaries of clerks and stenographers, . .	11,367 00	11,025 80	341 20
Traveling expenses of the members of the detective department, .	12,000 00	11,371 54	628 46
Special services and expenses in the investigation of fires, . .	1,750 00	1,661 67	88 33
Traveling expenses of the members of the inspection department, . .	19,000 00	16,844 81	2,155 19
Contingent office expenses,	9,500 00	7,815 47	1,684 53
Totals, . . .	$165,117 00	$159,302 61	$5,814 39

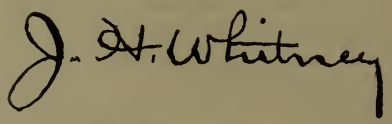
Conclusion.

It is due to my sense of gratitude that I should respectfully acknowledge the encouragement and cordial support rendered me by Your Excellency in the discharge of my duties; also the hearty co-operation and assistance rendered to this department by the Secretary of State, the Auditor, the Attorney-General and the several district attorneys.

I also desire to recognize the earnest and sincere co-operation of the deputies and every member of the department.

It has been my aim to see that the District Police shall act within the strict limits of the law, and with the highest standard of personal and official rectitude.

Respectfully submitted,



Chief, Massachusetts District Police.